SPECIAL REPORT SURVIVAL THROUGH TECHNOLOGY

September 11, 1972

RAILWAY AGE

The Railroad Nobody Knows

It is the railroad America could have-based on equipment now available from suppliers

RN72 '7
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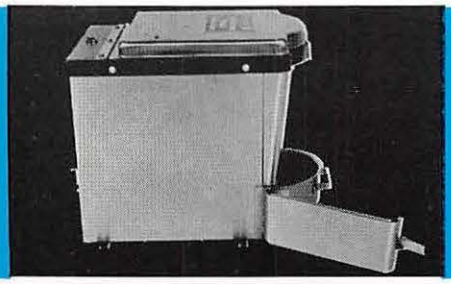
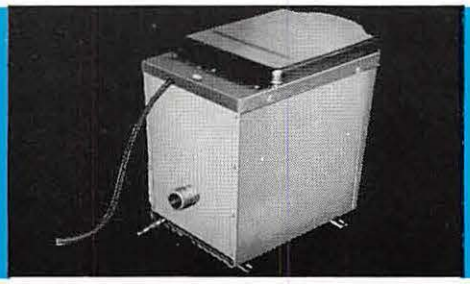
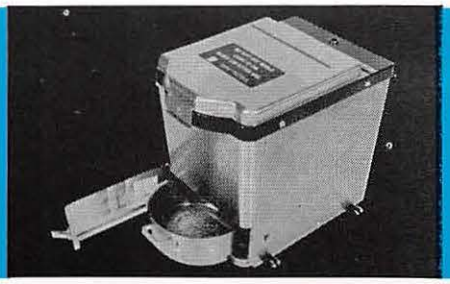
the SOLUTION

to Pollution is Reasonable with MODEL-S







— And that's the way it should be. Purchase of Research Products' new electric-incinerating toilet for locomotives is the most economical way to go because MODEL S uses the electric power of the locomotive to operate (no fuel tanks, no water, no pipes, no chemicals, no costly honey-wagon attendance), and because its servicing is minimal. Servicing of Research Products' Model S is the most simple, most economical of any retention toilet because (1) its human waste is incinerated to odorless, bacteria-free ASH, and because (2) that ASH can be emptied from the front of its removable ASH drawer. When you're making a check list on toilets, remember only Model S uses throughout heavy–gauge stainless steels and nickels, has CANDOR odor catalyst, incorporates a COVER/LID, gives you venting by either blower or ejector principle.

SOLUTION, SERVICE ECONOMY, PRODUCT QUALITY/RELIABILITY MAKE MODEL-S YOUR BEST BUY.

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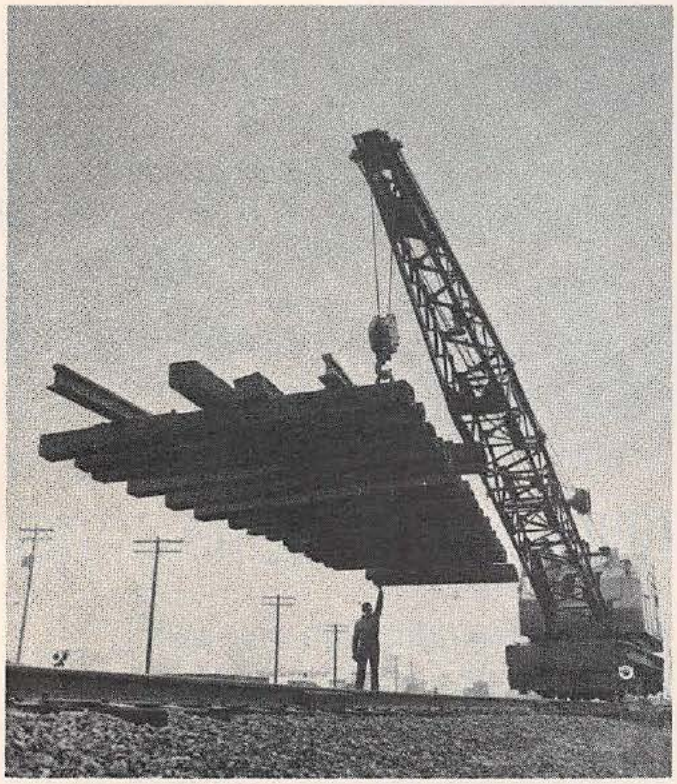
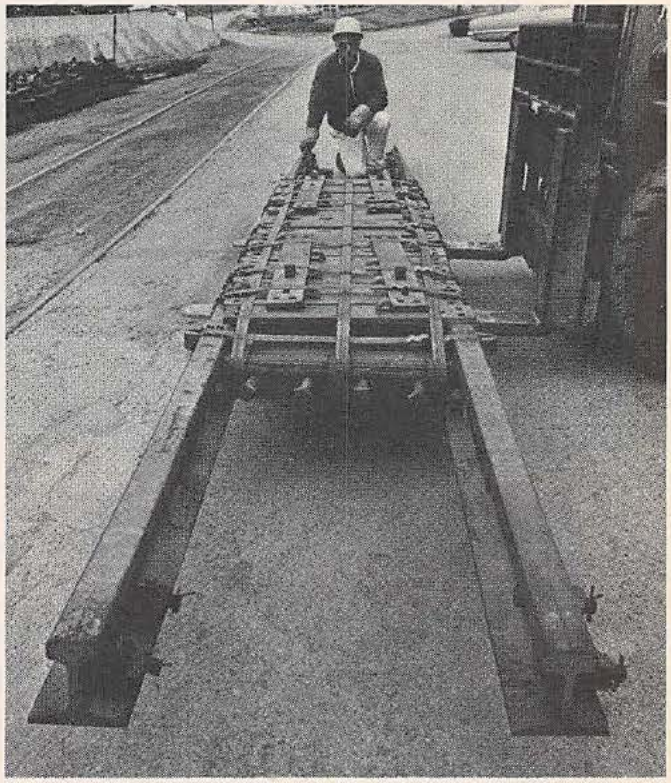
Circle 1 on coupon page 81

RP710

How do you like your switches?





Panelized?

Bethlehem developed the panelized switch idea a few years ago, and railroads have bought hundreds of them since. We shop-fabricate and assemble the switches at our Steelton, Pa., plant, then ship the assemblies to the site as complete units. All you have to do is position them, install the head-block ties, and complete the ballasting.

Panelized complete turnouts are now available too. Our engineers have worked out a secure method of loading turnout panels in a gondola car—two complete turnouts to a car. Your labor cost is cut to the bone, and installation is possible within four hours.

Packaged?

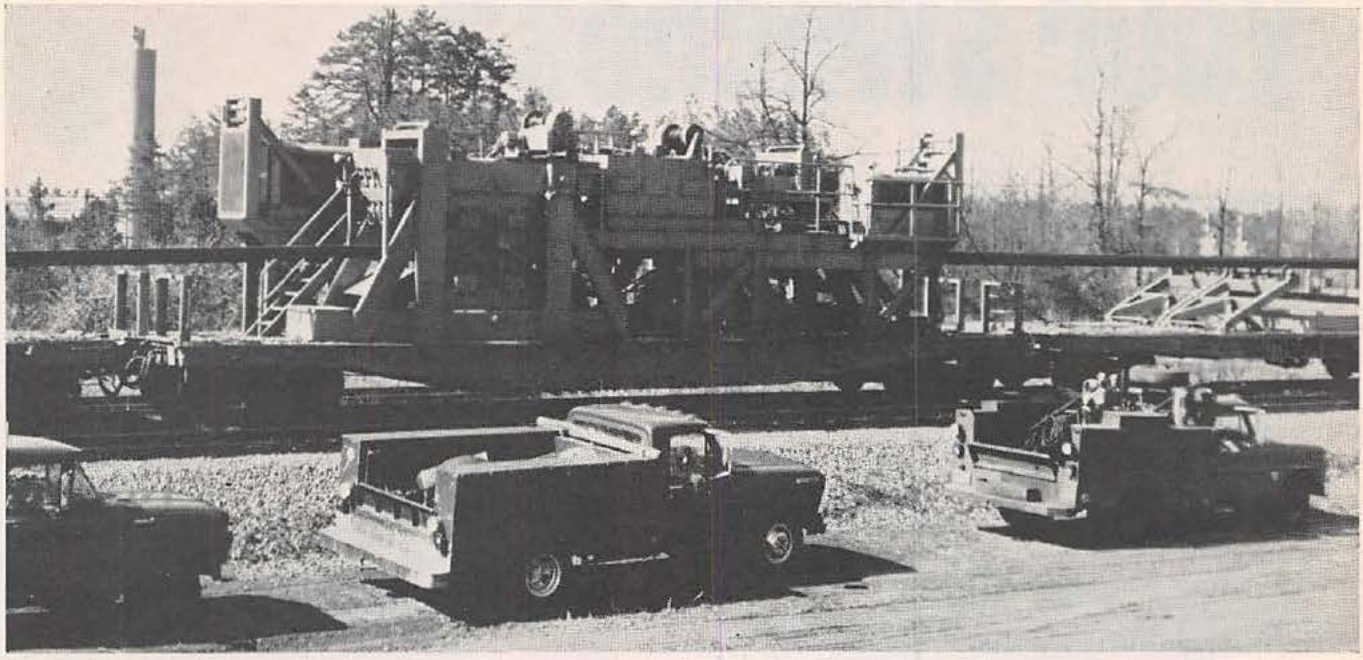
Bethlehem's latest time-and-money saving convenience is the Switch-Pak, a "kit" consisting of two switch points, two heel blocks, plus all the necessary plates, bolts, and rods for one complete switch. All items are firmly strapped together. You can choose from a variety of lengths and rail sections, and simply stack the switches in your storehouse until you need them.

In a similar way, we can also package component parts for complete turnouts —frogs and hook tie plates, closure rails, guardrails, and other needed materials.

We'll be glad to help you adopt these new buying ideas. Bethlehem Steel Corporation, Bethlehem, PA 18016.

BETHLEHEM STEEL

For fast, economical unloading or pick-up of rail strings (welded or bolted) we offer . . .



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Using this system, and with only one operator, you can pick up or unload two strands of rail in lengths of up to 2000 ft.
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- Stationary Hydraulic Rail Pushers (left). Handle CWR into racks or onto cars.
- Automated Rail Dismantlers. Remove bolts, etc., from jointed strings.
- Specialized Machinery for the Railroad Industry.

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Circle 3 on coupon page 81

RAILWAY AGE

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ASTRO

Inside

LUTHER MILLER

SURVIVAL

The theme of this special convention issue of Railway Age—"Survival Through Technology"—may seem at first glance to be an oversimplification of an immensely complex problem. We certainly do not mean to suggest, in the series of articles beginning on p. 39, that technological innovation alone is going to solve the problems of the railroads. We do mean to suggest that it is inextricably a part of any problem/solution.

Those who contend that the most pressing problem of them all is capital starvation are really saying that somehow billions of dollars must be raised to put the most modern technology that is available to work on the railroads.

Salvation-through-marketing is the hobbyhorse of others who would preserve and protect the industry—and it's hard to think of a better one. Again, technology enters the picture. In the brilliantly-executed study of railroads which former DOT Assistant Secretary Richard J. Barber prepared for the Senate Commerce Committee ("The American Railroads: Posture, Problems and Prospects"), there is this germane observation:

"Better utilization of freight cars . . .is probably the industry's number one challenge, because gains in utilization are of critical importance to broader marketing of rail service (notably for manufactured goods), reduced investment requirements, and enhanced financial strength." Barber has good things to say about the AAR's TRAIN system as a major answer to the utilization problem—but he notes that "its use to date has been limited largely because some carriers do not have sufficiently reliable interchange teleprocessing systems to provide the necessary timely information. While adoption of such a national system would be highly advantageous and permit the railroads to make more efficient use of their rail car fleet, the necessary capital commitment is large and the uncertainty that others would also do so has caused carriers to hesitate, thereby frustrating implementation of a potentially high payoff system."

Wherever you find a railroad problem, it's hard not to find some kind of technological gap. The "super-railroad" that Senior Editor Gus Welty envisions in his introductory essay will come only when these gaps are closed—not merely on individual properties, but system-wide.

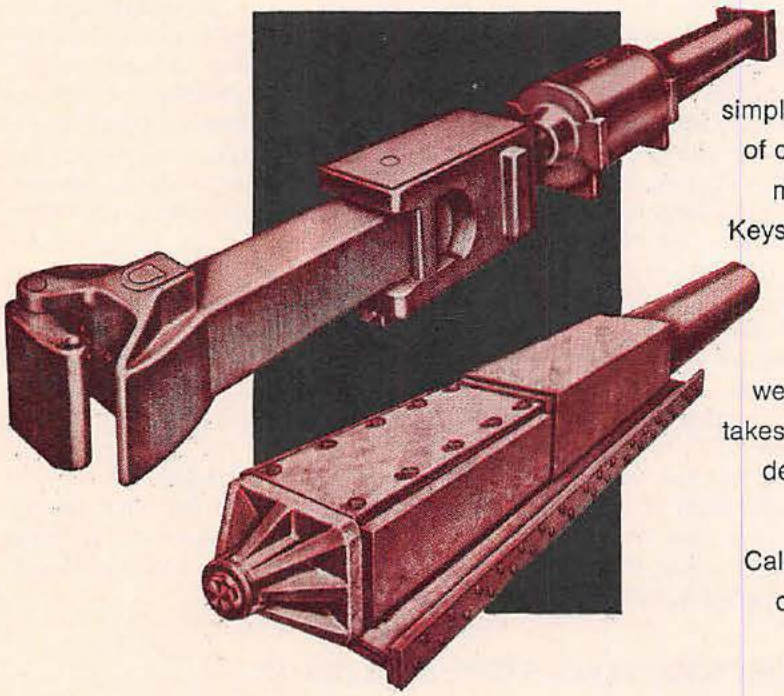
TORONTO: SMALL STEPS, BIG STRIDES

The story of rail transit in Toronto is one of the most edifying to be found anywhere, especially for south-of-the-frontier readers. Eschewing the all-or-nothing-at-all approach, Toronto has moved a step at a time; out of many small steps have now come giant strides. Railway Age Transit Editor Joe Asher recently visited Canada's leading city. He listened, he looked, he probed—and came back with the report that begins on p. 62.

KEYSTONE RELIABILITY...

most Railroad People take it for granted...

Not us!



Keystone SHOCK CONTROL'S service record is superior. Our simple design reduces the possibility of component failure to an absolute minimum. But we still torture-test Keystone SHOCK CONTROL units to leave no doubt that the rugged, sturdier units, with larger shafts, heavy rod heads, and massive wear-plated yokes have got what it takes to provide the long, trouble-free dependable service railroads want and need year after year.

Call Jim Smith at 717—761-3690 for complete information and prices.

KEYSTONE RAILWAY EQUIPMENT COMPANY
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Camp Hill, Pennsylvania 17011

Circle 55 on coupon page 81

RAILWAY AGE

September 11, 1972

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Short and Significant

SANTA FE, PC BACK IN CAR MARKET

Sixteen hundred additional new freight cars will be joining the fleet soon, thanks to orders being placed by Santa Fe and Penn Central. Santa Fe is getting 1,000 100-ton covered hopper cars from Pullman-Standard and 100 open-top hopper cars from Greenville Steel Car, at a total cost of about $19 million; PC plans lease of 500 50-foot, 70-ton general-purpose box cars, also to be built by P-S. Santa Fe already claims ownership of the nation's largest fleet of covered hoppers, now numbering more than 14,200 units; the PC lease will bring to 3,252 the number of cars in the road's 1972 program.

IT'S UNION SWITCH & SIGNAL—AGAIN

Five years ago WABCO changed the name of its Union Switch & Signal Division to the Signal & Communications Division. Now WABCO has decided to switch back to the old name, which dates from 1881. Said Keith Bunnel, vice president and group executive of the WABCO Transportation Systems Group: "Market research indicated that our customers preferred and had a strong feeling for the former name. And recognition in the market place is a highly desirable marketing tool." C. Benjamin Ramsdell is vice president and general manager of the division.

NOT A RECORD—BUT ALMOST

Winter wheat production in a 14-state area in the Midwest and Northwest is being estimated at 832 million bushels—just short of the total harvest in last year's record crop. According to Burlington Northern, the Pacific Northwest has a larger crop than in 1971, while the harvest in the Plains states is down slightly.

SALES WORKSHOP PROGRAMS SCHEDULED

Transportation Industry Consultants, Inc., is setting up a series of one-day sales-training workshops for freight sales personnel from all modes of transportation. The series, to be held in 12 cities, is scheduled to begin Sept. 19 in Chicago and wind up Nov. 29 in New York. Workshop leader will be Herbert Jeff, president of TIC.

CLIFFORD HEADS AD MANAGERS

H. Pier Clifford, advertising manager of the Southern, is the new president of the Association of Railroad Advertising Managers. He succeeds Charles R. Ward, general advertising manager, Union Pacific. Also elected at ARAM's recent annual meeting in Vail, Colo., were Robert D. McIntyre, manager-advertising department, Southern Pacific, first vice president; Tim Hogan, manager-public relations, Missouri Pacific, second vice president; C. Norman Beasley, advertising manager, Louisville & Nashville, third vice president; and Joseph D. Singer, recently retired advertising manager, C&O/B&O, executive secretary-treasurer.

MONTREAL SERVICE TO BEGIN SEPT. 29

Amtrak has picked Sept. 29 as the inaugural date for new daily passenger train service between Washington and Montreal via New York City, Springfield, Mass. and resort areas in New Hampshire and Vermont (RA, Aug. 28, p. 14). The new train will operate with sleepers, coaches and a grill-lounge car. It will leave Washington at 5:05 p.m. and New York at 9:10 p.m., arriving Montreal at 10:35 a.m. Southbound, it will leave Montreal at 6:25 p.m., arriving New York at 7:30 a.m. and Washington at noon. Amtrak President Roger Lewis said the decision to operate through New England rather than via Albany was "extremely close." He conceded that the route through New York State is shorter by 59 miles, and end-point to end-point running time is about three hours faster, but said these considerations could not offset the fact that the train would have to operate to New York's Grand Central Station, making cross-town transfers necessary for all through traffic. Amtrak estimated that either route would lose $400,000 in the first year of operations.

PC MOVES TOWARD BRIDGE RESTORATIONS

U.S. District Judge John P. Fullam has authorized a Penn Central expenditure of $4.5 million to restore the road's Shocks Mill bridge. The bridge carried a main PC freight line across the Susquehanna River, 20 miles southeast of Harrisburg, Pa., before its collapse as an aftermath of tropical storm Agnes last June. PC trustees also have petitioned the court for authority to rebuild, at a cost of nearly $1.4 million, six other Agnes-damaged bridges. The trustees, in addition, asked for court ratification of some $678,000 in emergency expenditures made just after the storm to re-route traffic over alternate lines. PC hopes to be reimbursed for the outlays with funds made available from long-term loans provided under terms of the Emergency Rail Facilities Restoration Act pending in Congress. PC's Chemung River bridge at Corning, N.Y., became the first major bridge to be restored by the road since the storm. The expedited job cost nearly $1 million.

Circle 5 on coupon page 81 ▶

the dollar saver

Universal®
MODEL 1900-DJ AUTOMATIC
Slack Adjuster

The Model 1900-DJ Slack Adjuster assures proper piston travel at all times, providing many dollar savings in your labor costs.

It automatically adjusts for brake shoe wear, quickly, safely—brake shoe wear is adjusted upon the release of each brake application. The slack adjuster lengthens automatically when brake shoes are renewed—no manual adjustments are necessary.

The Model 1900-DJ has been carefully researched, engineered and tested for maximum reliability. THE UNIQUE CONE CLUTCH MECHANISM HAS BEEN PROVEN THROUGH YEARS OF SERVICE. All quality parts assure strength, durability and efficient performance.

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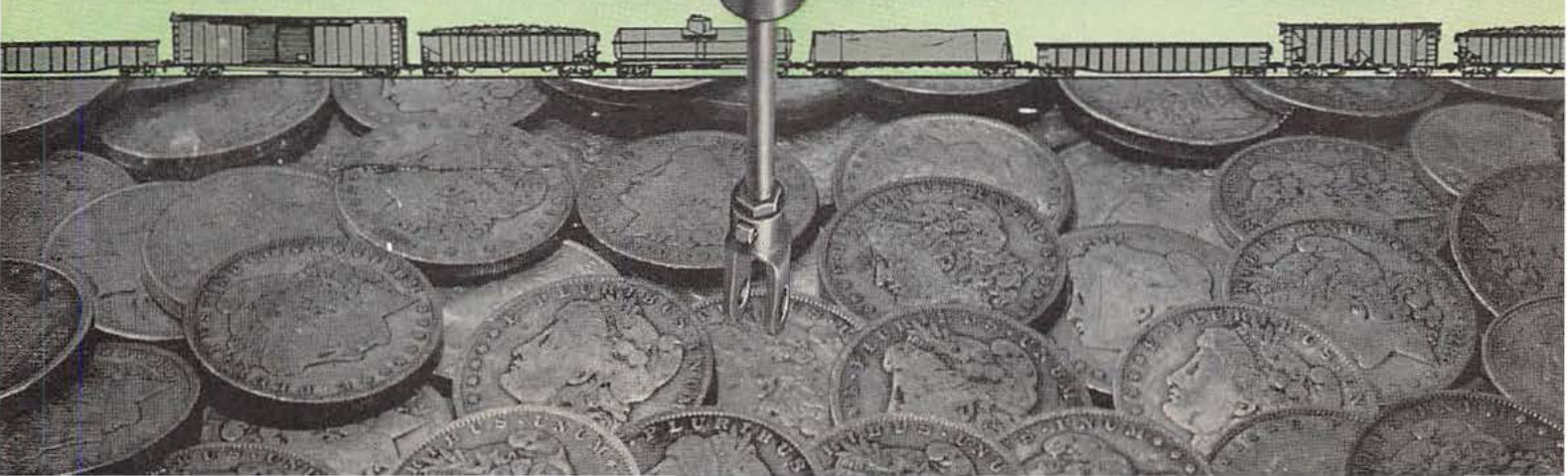


Congress ready to move on grade-crossing aid

Whatever else happens this year in terms of government aid to rails, 1972 will go down as the year a concerted attack on the problem of grade crossing safety finally began.

Ready for approval by the Senate in the next few days is a bill that would earmark at least $150 million to reduction of hazards at grade crossing sites. The amount could go higher. In all, $300 million is included in the bill—S. 3939, the Federal Highway Act of 1972—for a new accident control program at grade crossings and other hazardous locations. The $150 million is the floor recommended by the Senate Public Works Committee in its report on the bill for expenditure on grade crossings alone.

The bill also:

—Directs that states use these funds for grade crossings anywhere within their boundaries, and not merely on the Federal-aid system.

—Lets stand a provision of present law that permits states to spend up to 10% of their annual Federal highway aid for protection or separation of grade crossings.

—Authorizes a DOT demonstration project to relocate rail lines from the center city area of Lincoln, Neb. A 70% Federal matching grant of $3 million is authorized for the project.

Swift Senate and House approval of the bill is expected.

When that happens, in effect one provision of the proposed Surface Transportation Act, backed by regulated surface carriers, will then become written into law. The provision was separated from the STA bill and sent to the appropriate roads committee several months ago.

Almost simultaneous with the Senate Public Works Committee action was the release of Part II of an FRA report on grade crossing safety which recommends a $750-million improvement program over the next 10 years. It said completion of such a program would save about 500 lives a year and prevent nearly 4,000 motor vehicle-rail collisions annually.

(FRA said recently rail-highway grade crossing accidents in first half 1972 totaled 625, down from 682 in 1971. Injuries went from 1,711 to 1,698.)

Part I of the FRA report was released earlier this year. It outlined the problem, noting there were 232,000 U.S. grade crossings of which only 47,000 had train-actuated protective devices. The report said 12,000 accidents occurred every year at the grade crossings, or an average of 32 a day.

The new Part II report, besides the $750-million improvement program, urges that rails' share of Federal grade crossing projects be reduced from 10% to 5% and urges that rails not be required to share in any such project if railroads do not benefit.

A joint AAR-FRA inventory of the nation's grade crossings was announced in July. The 14-month, $2.55-million project is under the direction of AAR Executive Director of Highway-Rail Programs Max R. Sproles. The report is due late in 1973.

C&O/B&O get new livery, new name

Chesapeake & Ohio/Baltimore & Ohio have adopted new, "more visible" colors (bright yellow and blue, with vermilion stripes) and a new "short name" designed to enhance the combined roads' visibility in the marketplace: "Chessie System."

First locomotive to bear the new colors and the new name is No. 1977, denoting the 150th anniversary of the founding of the B&O which will be celebrated five years hence.

C&O/B&O President Hays T. Watkins explained: "The C&O and B&O are two separate railroads. While the C&O company controls the B&O company through stock ownership, the two railroads have unified management in all major areas. To meet their transportation competition, C&O and B&O have been creating, through coordinations and consolidations, a combined system. To emphasize that service, our freight traffic salesmen have urged that we adopt a short, popular system name for everyday use."

It was felt, said Watkins, that the "C&O for Progress" slogan was outdated graphically—and the B&O's 75-year-old Capitol Dome symbol was more suggestive of government than transportation. So Chessie—the kitten that made her debut in 1933 in a Fortune Magazine ad promoting the C&O's "George Washington" passenger train—was picked. Said Watkins: "While Chessie used to stand for 'Sleep Like a Kitten,' our people said that today it symbolizes the care with which a patron's freight is handled."

Circle 6 on coupon page 81 ▶

Last year's covered hopper?

Look again.

There's a new look to maximum cube.

Look at the end of the new Pullman-Standard covered hopper car and you'll see a new silhouette. There's a new arch to the roof line that combines new strength with a longer trough hatch. This means easier loading for maximum use of actual cube, or, more usable cube than other covered hopper car designs.

But more payload is just one benefit of a dramatic engineering transformation.

The longer length trough hatch opening is completely uninterrupted, except for the recessed hopper partition sheets. This means clean, continuous loading, to the very ends of the car.

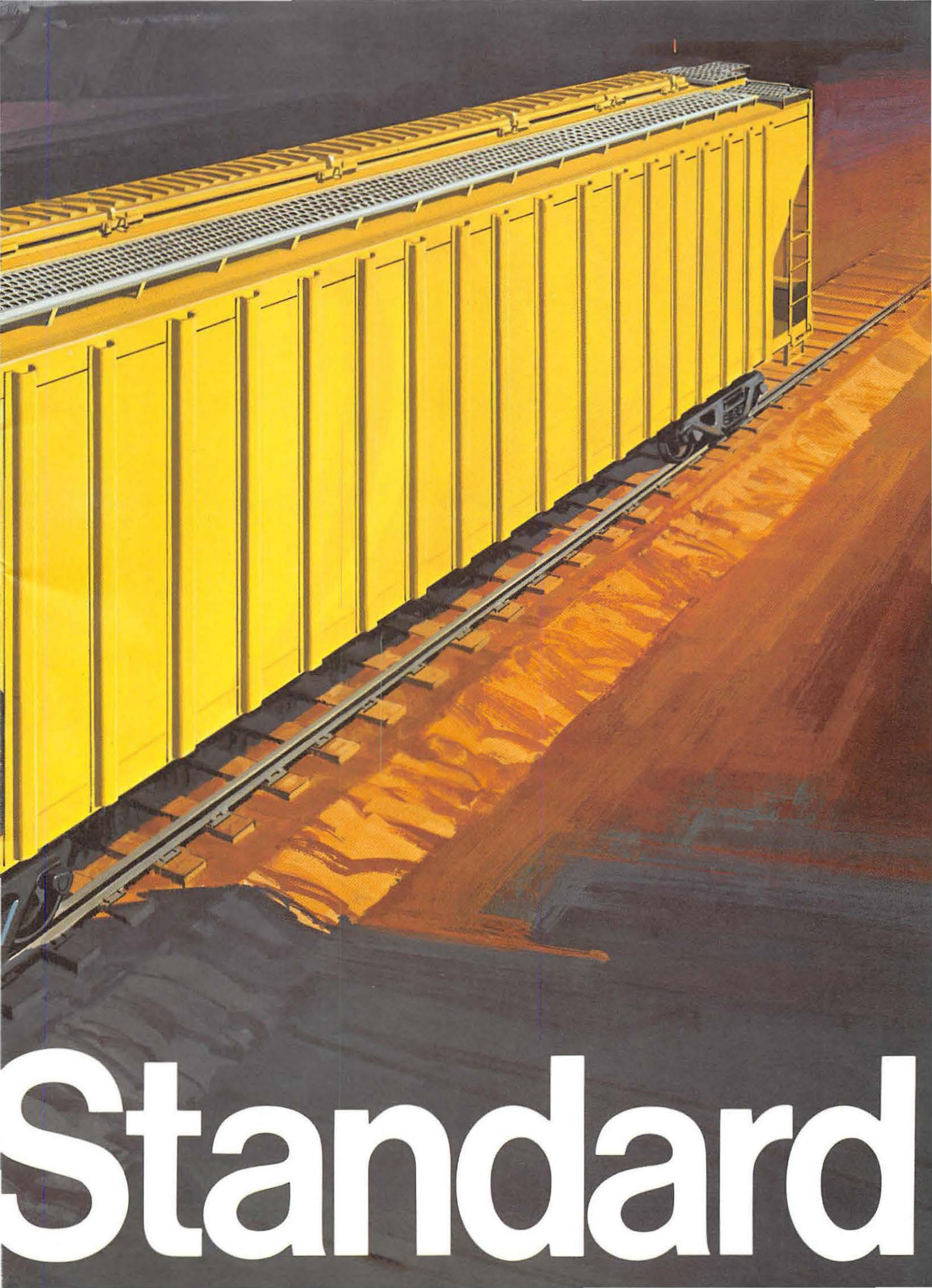
These shipping benefits are plussed by a host of additional improvements.

Nineteen more features include a choice of hatch opening widths, new hatch holddown locks, and new, more compressible extruded gaskets for better sealing. The new covered hoppers also provide *longer truck centers* and *lower centers of gravity* for better riding, as well as *lighter tare weight* and *more usable cube* for given car length in its plate configuration.

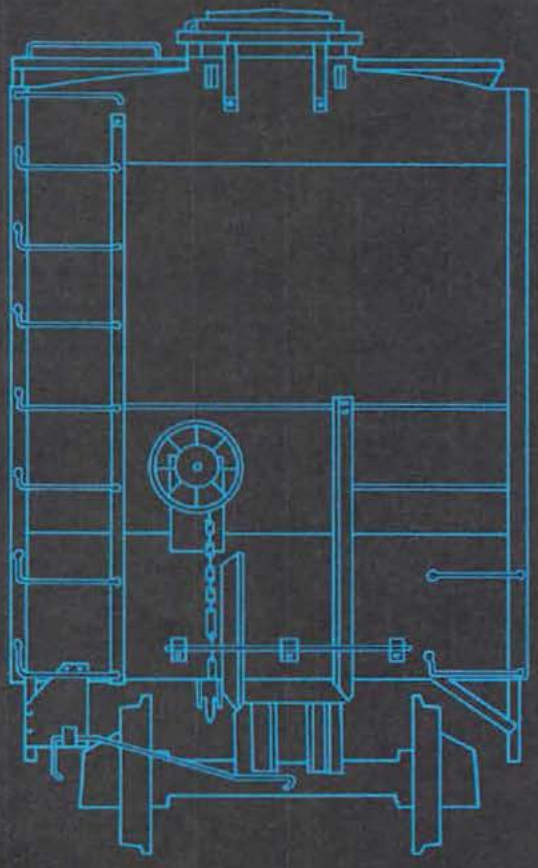
Pullman-Standard's new covered hopper cars come in a broad range of sizes, *with sizes through 5100 cubic foot capacity meeting Plate B clearances.* Available with or without center sill, and custom-built to best fit the requirements of both railroad and shipper.

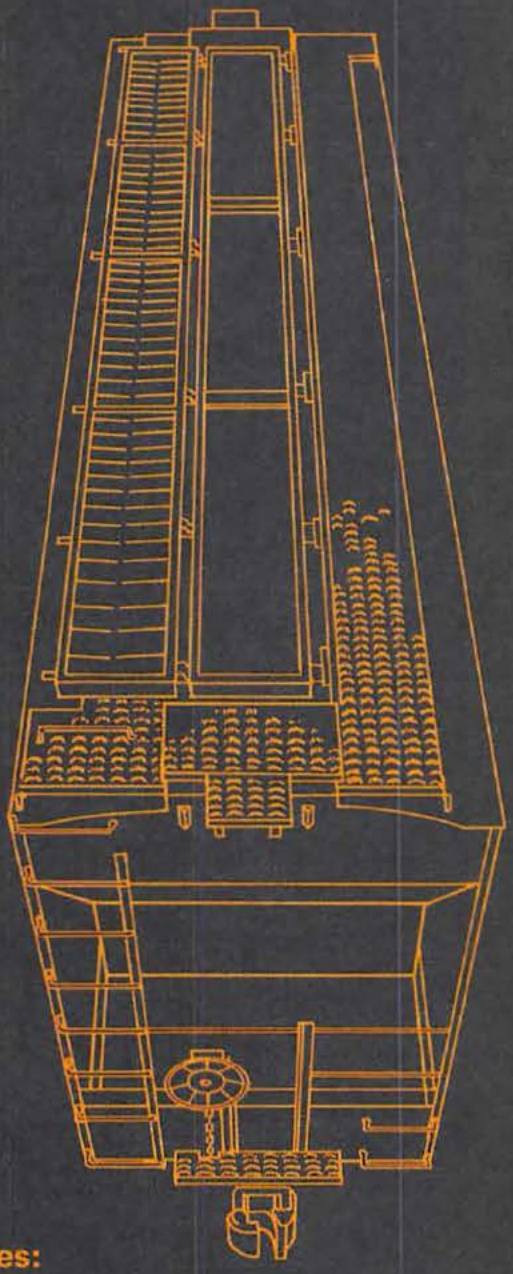
There's more than a new look to Pullman-Standard's covered hopper cars. There's a whole new performance capability, proven and backed by the world's largest builder of rail cars!

Pullman-


Standard

Re-engineered to a new standard in covered hopper cars.





The new Pullman-Standard covered hopper cars:

- **WITH or WITHOUT CENTER SILL**
- **LONGER TRUCK CENTERS**
- **LOWER CENTERS OF GRAVITY**
- **LIGHTER TARE WEIGHT**
- **MORE USABLE CUBE**

PLUS 19 more new engineering features:

- new roof design maximizes angle of repose
- new roof strength
- no roof carlines
- full length continuous trough hatches
- reinforced hatch coaming ends
- 20 or 24-inch wide hatch openings
- choice of two interchangeable fiberglass hatch covers
- new weather-resistant holddown design
- new holddown gasket seals
- stronger hatch cover design
- new extruded rubber hatch seals
- improved holddown locking device
- wider, pressed steel running boards
- wider, roll-formed side posts
- new standard roll-formed side plates
- forged steel front draft lug arrangement
- improved brake pipe positioning on cars without center sill
- safety guards at ladder rung ends
- new smoother interior surfaces

For complete information pertaining to the new line of Pullman-Standard covered hopper cars, call 312/939-4262. Or write Marketing Department, Pullman-Standard, a division of Pullman Incorporated, 200 South Michigan Avenue, Chicago, Illinois 60604.

Pullman-Standard

The new standard in covered hopper cars

Watching Washington

REID BEDDOW

FRENCH TURBOS FOR U.S.?

Major equipment announcements involving Amtrak are forthcoming here within the next few weeks:

—Purchase by Amtrak of two Turbo-Trains built by United Aircraft and now leased by DOT is certain. Amtrak also would like to get its hands on other TurboTrains in Canadian service.

—Subject to approval of specifications, Amtrak will acquire foreign advanced passenger equipment. Both British Rail and French National Railway proposals are under study, but the betting is on Amtrak acquisition of French Turbo equipment (RA, Aug. 14, p. 20). Said an Amtrak officer, "A lot of eyes are going to be opened when the contract is let. U.S. manufacturers have had a long time to get on the ball, but they haven't."

(Where would the European Turbos be operated? Some reports—not confirmed by Amtrak, but not denied, either—have it that three routes are presently under consideration: Chicago to Carbondale, Chicago to Springfield and St. Louis, and Chicago to Milwaukee. Reportedly, the French government has offered to lease Turbos to Amtrak.

(The interest of the French in the U.S. passenger-train market has been evident for some time. One U.S. carbuilder reportedly offered to sell its facilities to French builders; the latter declined.)

—Announcement of Amtrak's capital spending plans for fiscal 1973, including at least $35 million for new passenger cars and locomotives.

In addition, Amtrak has under study the feasibility of establishing its own passenger car overhaul facility because of modernization costs averaging above $100,000 per unit on 300 of the 1,300 used cars it has purchased from rails. Installation of retention toilets alone will cost Amtrak an additional $3 million this year. But a barrier to control of these mounting costs is labor protection clauses in the original Amtrak Act.

Note: FRA and DOT have virtually withdrawn from active direction of passenger service development, permitting Amtrak to assume more and more leadership in the field—though of course Amtrak will be closely tied by DOT pursestrings.

VOLPE RESIGNATION RUMORED—AGAIN

At least one top personal aide to DOT Secretary John A. Volpe has told associates he will resign after Nov. 7, refueling rumors that Secretary Volpe himself plans to relinquish his post soon. The aide is speechwriter Christopher Knapton who has earned high marks from both press and career civil servants. Secretary Volpe has led his department since 1969, and for all that time insiders here have been saying he would like to crown his career as Massachusetts governor and DOT chief as Ambassador to Italy. State Department sources say, however, it is very unlikely the present U.S. Ambassador to Italy will be replaced, since he has been at his post a relatively short time. But these sources say it could be Mr. Volpe will be appointed special Presidential envoy to the Vatican. Guessing as to Secretary Volpe's replacement is, naturally, a capital pastime. It is said Federal Maritime Commission Chairman Helen Delich Bentley would like the job.

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Lines on Labor

GUS WELTY

AUTOMATION? IT'S POSSIBLE, BUT...

If you've ever been stuck in an automatic elevator—and who hasn't?—you somehow just don't have complete and absolute faith in total automation. That may be one reason why most people tend to be skeptical, when the dreamers and schemers start talking about the railroad of tomorrow as a wholly-automated instrument of transportation. Technologically, there is nothing at all wrong with the automated railroad. The concepts and the technology involved with the Bay Area Rapid Transit system prove this. So do the operations of a few small, specialized railroads, mostly hidden off in the boondocks. But the railroad, as it's now conceived, totally automated? Forget it.

The simple fact—today—is that nobody would accept the idea of a 200-car or a 100-car or even a 10-car freight train following its flanged-wheels-on-rails guide without the hand of man somewhere on board with, at the very least, an override control. Nobody could be convinced that machines won't fail—or that they could be made fail-safe. Nobody could be convinced that it's safe to send automated trains out to meet automobiles at the nation's 223,000 grade crossings (though that might not really be such a bad idea, since a motorist might exercise a bit more common sense if he knew the train he was tempted to challenge was actually a machine-run machine). And, of course, nobody would ever believe that a rail labor movement that demanded employment of firemen on diesels could be made, absent the millenium, to agree to automation.

...THE REAL NEED IS FOR MAN/MACHINE PARTNERSHIP

The point probably is that railroads don't need automation. What railroads need is not the replacement of man by machine, but rather a far better synthesis of man and machine.

In some areas, progress obviously has been made. Over the 10-year period 1962-71, railroad ton-miles climbed from 592 billion to almost 740 billion, while employment dropped from 700,000 to less than 545,000. Obviously, productivity—if measured by ton-miles-per-employee—has increased. But those bare figures do not take into account the contribution of plant-and-equipment improvement. Nor do they give any insight as to employment trends, operating vs non-operating.

Penn Central may or may not be typical of the situation facing railroads generally, from an employment standpoint. PC's situation, most simply put, is that since the reorganization process began, employment has been cut by about 13,000—but mostly on the non-op side, and reductions are "now focused on the operating crews, the most expensive part of PC payroll costs." PC President Bill Moore's argument is that progress in this area "must be speeded up. We must convince the brotherhoods that it is to the best long-term interest of their members to reach a reasonable, permanent settlement."

In view of recent national settlements—which should bring productivity improvements—quoting Bill Moore on this specific problem might be like carrying a red flag while cozying up to a bull. But, in general industry terms, two facts do seem to stand out: (1) Total operational automation isn't coming and may never; but (2) man and machine do have to be better blended, on the operating side, for the productivity increases needed for the survival of both employer and employee.

Facts you should know about automatic car identification:

KarTrak was first
The concept of today's AAR automatic car identification system was originated and developed by GTE. The first operational KarTrak system was installed in 1965. In 1967, the AAR established KarTrak as the industry standard.

KarTrak is operationally proven
More than 180 KarTrak systems, with over 5,000,000 operating hours, are currently in service. Full-scale tests proved KarTrak identification information to be 99.99% accurate. The dependability of the KarTrak scanner-decoder system is attested to by the fact that KarTrak users are experiencing in-service system availability in excess of 99%.

Servo acquires KarTrak
On May 2, 1972, KarTrak was acquired by Servo from GTE Information Systems, Inc. KarTrak's key personnel also made the move to Servo. The transition was made smoothly, without interruption of service—as a matter of fact, 22 KarTrak systems were delivered within the first 60 days after the acquisition. The expanded Servo-KarTrak operation is now completely consolidated and moving ahead.

A single source of completely integrated systems
Servo is the only fully centralized supplier of AAR automatic car identification equipment and systems in this country. Systems engineering, product engineering, manufacturing, marketing, performance responsibility and financial stability—
all under a single corporate roof!

A North American network of customer service facilities
Only Servo offers 14 strategically-located service facilities, staffed and equipped to provide on-the-spot customer engineering, personnel training, spare parts availability, routine service, preventive maintenance and field repairs.

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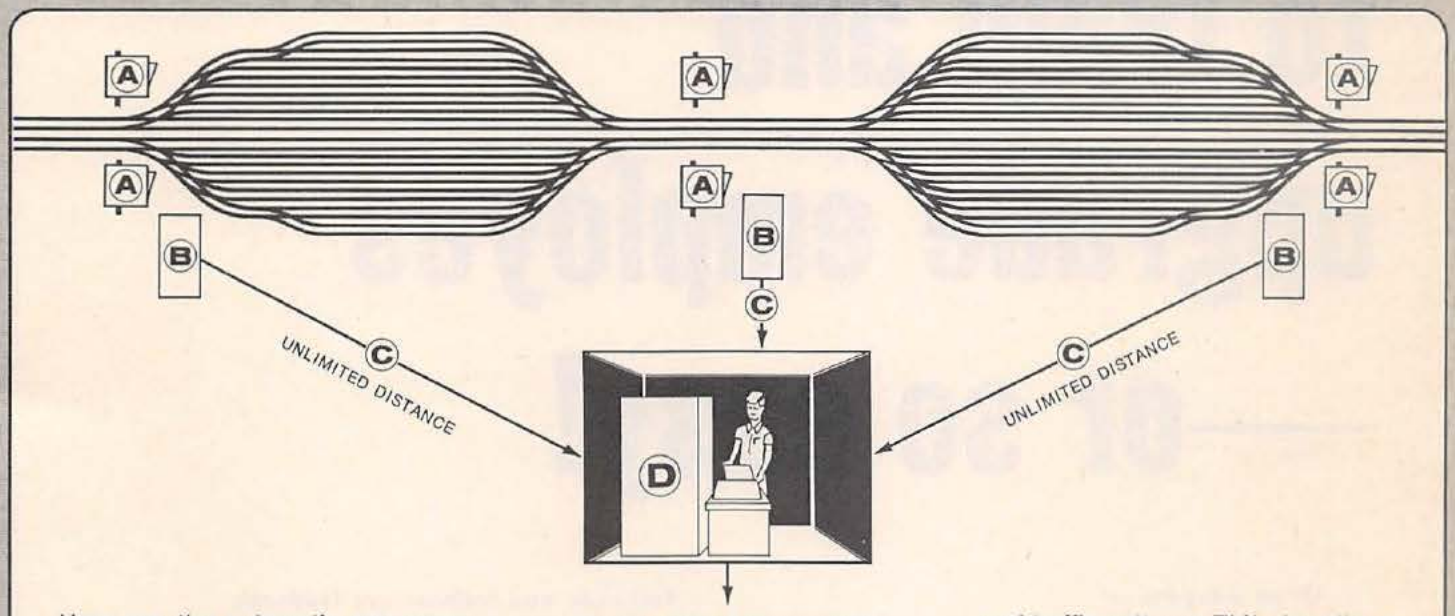
Total Systems*
For Yard Car Movement Control & Information



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Here are the automatic car movement control and information systems you've been looking for. Designed to provide complete coverage of yard and terminal areas, these totally integrated systems offer the built-in versatility and expansion potential necessary to handle a wide range of requirements. Basic elements in a typical system include: KarTrak scanners at each label-reading site **(A)**; A single-unit, real time KarTrak Multi-Coder **(B)** for each pair of scanners; Programmable data concentrator/processor **(D)**. Data transmission **(C)** to the processor is via standard digital communication techniques, without any distance limitations, permitting optimum location of scanners based on train operations and traffic patterns. This also allows the processor to be conveniently located in a yard data center, making it accessible for associated data processing functions. Servo's exclusive KarTrak software packages include our Scanner Input Concentrator System (SICS) and Enhanced Consist Output System (ECOS). To meet individual customer requirements, a full selection of cost-effective peripheral terminal equipment is offered, such as card punches, high speed card readers and page printers.

Whatever your car information requirements are, just ask for it—Servo KarTrak can do it. You can start by writing or calling today. Servo Corporation of America, Hicksville, L. I., New York 11802, Tel. 516-938-9700.

*When we talk about "total systems," here's what we're talking about:

1. **PROVEN HARDWARE & SOFTWARE.** Just like a chain and its links, a reliable car movement information system depends on proven, reliable equipment—and that's another name for KarTrak.
2. **CUSTOMER REQUIREMENTS ANALYSIS.** This is how we start, with an in-depth analysis of all factors such as yard and track layout, communication network, equipment location, existing systems and procedures, personnel requirements, etc.
3. **SYSTEM INTEGRATION.** Systems engineering merges your requirements with our equipment. And our broad selection of standard system products means we don't have to fill round holes with square pegs!
4. **EQUIPMENT FABRICATION.** Here's where we add the vital ingredients of modern manufacturing facilities and strict quality control standards to assure equipment that keeps on working with long-term reliability and minimum maintenance.
5. **SYSTEM INSTALLATION, TEST & CHECKOUT.** Putting everything together also includes training of customer personnel, development of preventive maintenance procedures and ongoing field service.

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It has never been so urgent to train and upgrade employes ——or so easy!

. . . Or so inexpensive!

Home-study courses, tailored to the different needs of the maintenance-of-equipment department, can develop skilled journeymen from your present force of unskilled labor. It can cost as little as $6 per month per trainee. The Railway Educational Bureau provides the courses, and does the grading.

Many railroads use it!

The Bureau already has formal arrangements with about a third of the Class I railroads, and, with many industrial and other short-line roads. The completion of four-year courses qualifies apprentices as journeymen. Some roads use accelerated programs, turning out skilled machinists, electricians, carmen, car inspectors and other craftsmen in as little as three years. In the case of especially responsive students, two years is sufficient for the regular four-year course. Many other railroads use shorter REB courses for upgrading and refreshing. The Bureau also offers four two-year courses, as follows: Locomotive Engineers, covering diesel-electric equipment and air brakes; Locomotive Electrical Equipment; Locomotive Mechanical Equipment; and Car Inspectors and Carmen.

Railroads and trainees get feedback

Instructors of the Railway Educational Bureau, all active railroad men themselves, grade students' examination papers and make individual comments and suggestions to the students when such help is needed. In the case of formal, company-sponsored programs, the railroad gets a monthly report of each student's progress.

Who qualifies?

Any railroadman. Courses are written for employes with a high school level of education.

How to participate

Besides formal apprentice training programs on a contract basis, railroads may help an employe by paying half his monthly tuition, or all of it, or by reimbursing the employe on successful completion of his training. Or they may authorize payroll deductions.

For more information

Write now, or phone, Reid Kenedy, Railway Educational Bureau, 1809 Capitol Ave., Omaha, Nebr. 68102, telephone (402) 341-7889.

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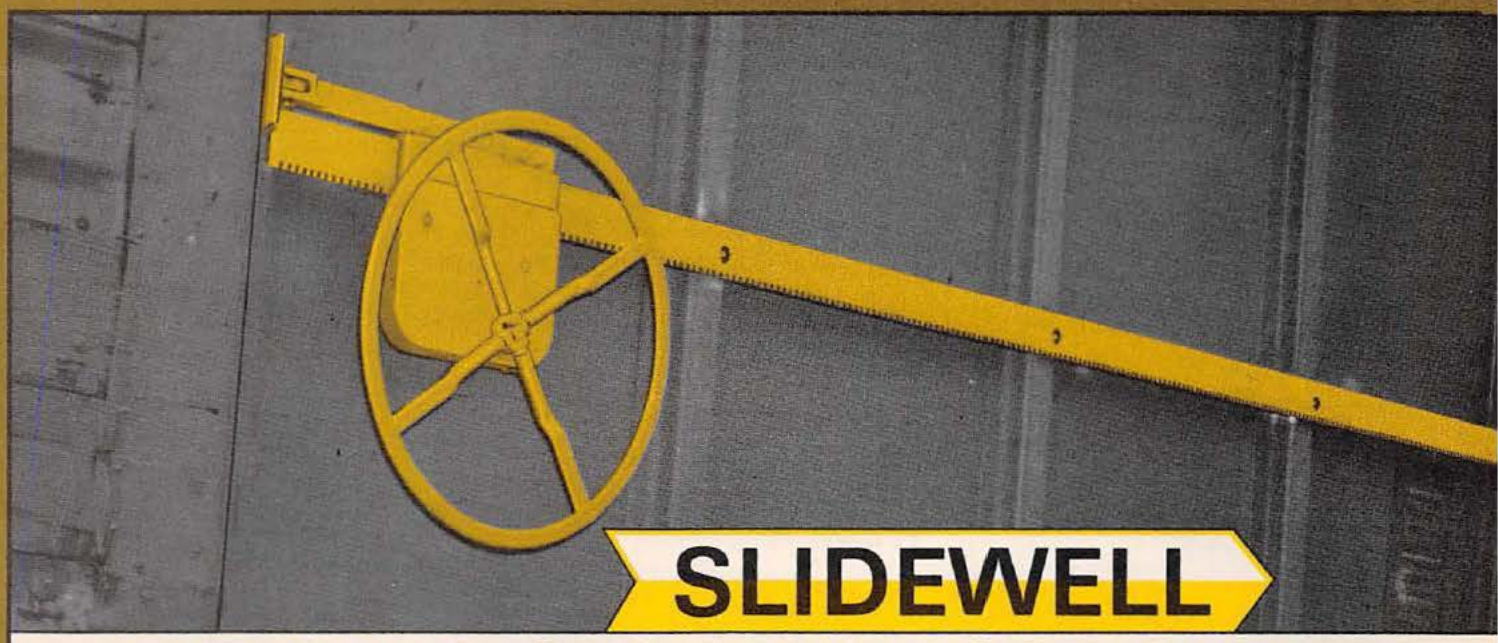

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THE SAFE, ONE MAN DOOR OPENER

The use of fork lift trucks to open car doors is contrary to O.S.H.A. regulations regarding the use of industrial trucks on or around ramps, platforms, elevated docks or freight cars. These regulations are being enforced and several concerns have been cited for this unsafe and door damaging practice.

SLIDEWELL is the only mechanical door opening device integral with the car to provide safe, easy, damage free opening and closing of car doors. The Slidewell door opener is designed with a 35-to-1 mechanical advantage in the direction of door travel so that one man can open even the heaviest and balkiest of doors in the time it takes to turn the control wheel. The unit is applicable to both sliding and plug doors.

EASY INSTALLATION—The entire Slidewell mechanism is applied completely from the outside of the car. It is a simple low cost installation, fastening to the car side and door with blind lock-bolts and a small weldment. Installed dimensions comply with Plate B and C clearances.

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Circle 9 on coupon page 81

Chesser asks special ton-mile tax to bail out RRB

United Transportation Union President Al H. Chesser has come up with a new plan for helping to finance the Railroad Retirement system without putting any greater direct burden on either employees or employers: levy a special ton-mile tax on all rail freight shipments. Chesser hasn't settled on a specific tax rate nor has he established a timetable for promoting the plan. But, he told members of UTU's Association of General Chairmen and legislative directors meeting in Las Vegas, the program will have "the highest priority."

Chesser's proposal follows up on a recent study by a five-member Federal commission which looked at the solvency of the system and made certain recommendations concerning its future financial stability.

Commission recommendations included establishment of a two-phase program of annuities, the first of which would be tied to the Social Security system, insofar as tax rates and annuity payments are concerned. The second phase would involve payments to retirees over and above those applicable under Social Security regulations. In coming up with his plan, Chesser said he recognizes a need for restructuring the system. He took issue with a Commission finding that the system is in a critical financial condition, but he did not oppose the two-phase program: "We do not find too much fault with a two-tier system so long as it is correctly established. The real question is, how do we secure the added funds needed to meet the challenge of keeping the system in sound financial condition."

UTU's president said he believes that "substantial support" for such a plan could be developed in Congress—though he also predicted that rail industry leaders "may be split in their reaction." He noted, however, that the ton-mile tax would "relieve the already overburdened railroad worker so far as Railroad Retirement taxes are concerned. Likewise, such a tax would relieve a financially-squeezed industry from paying additional taxes to support the system."

The amount of the tax, he said, "would be insignificant so far as shippers' over-all costs are concerned. This is a fair and equitable way to finance the Railroad Retirement system. . .Such a program is. . .entirely justified."

BN officer wins Shell camper/caboose

The most unusual piece of equipment at the Railway Supply Association's track show in Chicago next week will be a vehicle that looks like a 1900-vintage "bobber" type caboose, but is actually a custom-designed camping trailer. It is the grand prize in the Shell Oil Co.'s "Name the Products" contest (RA, April 10, p. 29). Painted in official Burlington Northern colors, it will be turned over on Sept. 18 to the grand prize winner, R.W. Spannring, BN's director mechanical services.

Fifteen second-prize winners are receiving custom desk sets, including a scale model of the "General" (engine No. 39 of Civil War fame), a pen, and a railroad timepiece. These winners are John I. Hillard, William M. Hobart, Robert A. Hobart, R.F. Blakeslee, J. John O'Keefe, D.N. Engelhardt, all of BN; H. Carlysle Cummings, Gilbert Dreiling, R.D. Drawbaugh, Santa Fe; J.M. McGuigan, Penn Central; L.S. Wood, Jr., Southern; R.J. Chinn, Illinois Central Gulf; Ray J. Duman and Darrell D. Fisher, Milwaukee Road; and William T. Money, Southern Pacific.

FRA revises track standards

The Federal Railroad Administration's track safety standards containing proposed modifications were scheduled to be published in the Federal Register late during the week of Sept. 4. Important among the proposed modifications, according to John E. Rourke, director of the FRA's Safety Act Task Force, are revisions in the requirements regarding defective rails. The initial safety standards made no allowance for the size of defects. Size designations are included in the proposed revisions. Also permitted is the use of judgment of a qualified person in determining the restricted speed at which service is allowed over rail containing defects.

Hearings on the proposed modified standards have been scheduled by the FRA to be held in Washington on Sept. 22. Sept. 30 has been set as the date on which comments will be closed. The effective date of the modified standards has been set so as to coincide with the effective date of the original standards, which is Oct. 16. Application for extension of the effective date may be made by the railroads acting individually or collectively through the AAR.

The proposed modifications, said Rourke, take into consideration Amtrak's request for higher passenger-train speeds. The modifications would permit higher speeds for passenger trains over all except Class 6 track.

Among other proposed modifications:

—The provision requiring monuments alongside the track giving track geometry is eliminated.

—The distance between non-defective ties in Classes 4, 5 and 6 track is increased from 45 inches to 48 inches (thus giving recognition to the 23-inch tie spacing used by many railroads).

—The location of non-defective ties in joint areas is clarified.

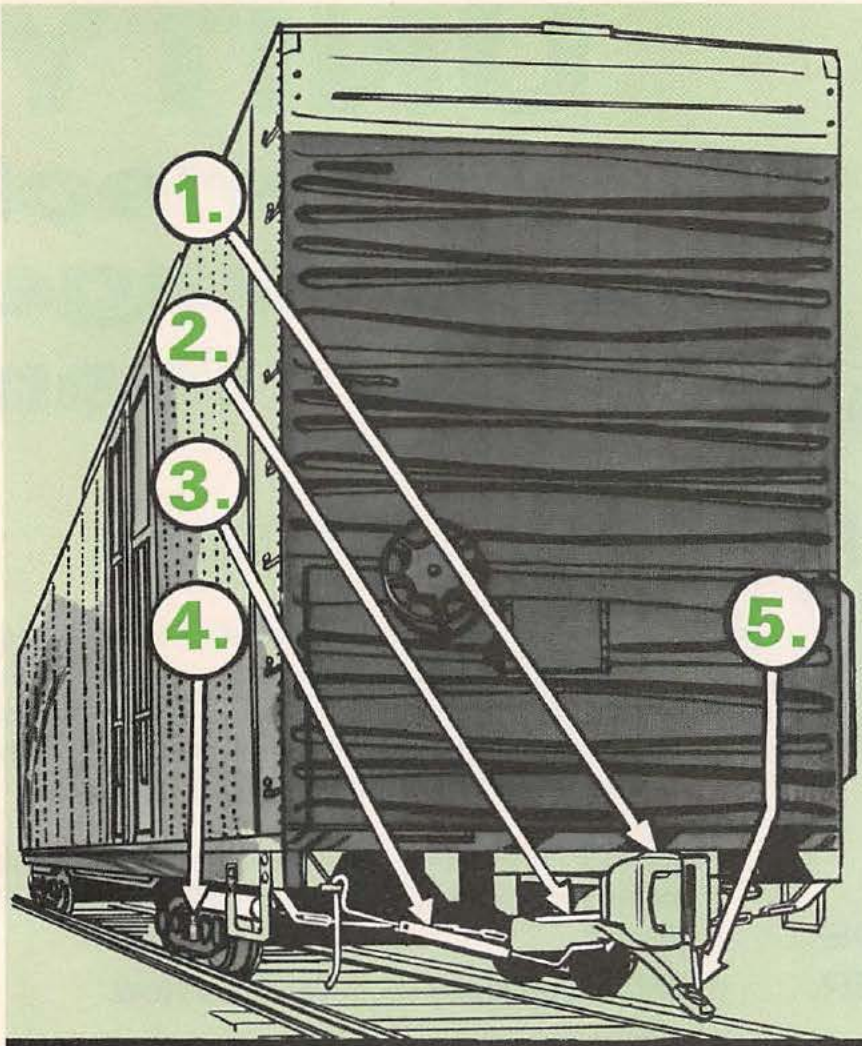
—Mechanical inspection of track is permitted if the device meets the approval of the FRA.

—New rail that has been inspected inductively or ultrasonically before installation in track is exempted from inspection for three years.

Thirteen get specs on CTA car order

The Chicago Transit Authority has set Oct. 12 as the date on which bids for 100 new transit cars will be opened—and at this point, 13 requests for car specifications have been received, from Mitsubishi International Corp., MLW-US Inc., Vought Aeronautics Division of LTV, Rohr Industries, General Electric, Pullman-Standard, St. Louis Car, Commercial Office of Spain, Nissho-Iwai America Corp., Toshiba International Corp., Boeing, Budd, Coach & Car Equipment. When CTA announced earlier this year that its 1972 capital-improvement program would total $121.7 million, the estimated cost of the 100 air-conditioned cars was set at $22,230,000. As the cars arrive, they will permit phasing out of the last of the system's 50-year-old cars.

Japanese manufacturers have long tried to crack the U.S. rolling stock market and twice got to the bidding stage—on a PATH order (which subsequently went to Hawker-Siddeley Canada) and on the recently-awarded WMATA order (which went to Rohr).



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The other guy's car.

It's an old story. A frustrating, incredibly expensive one.

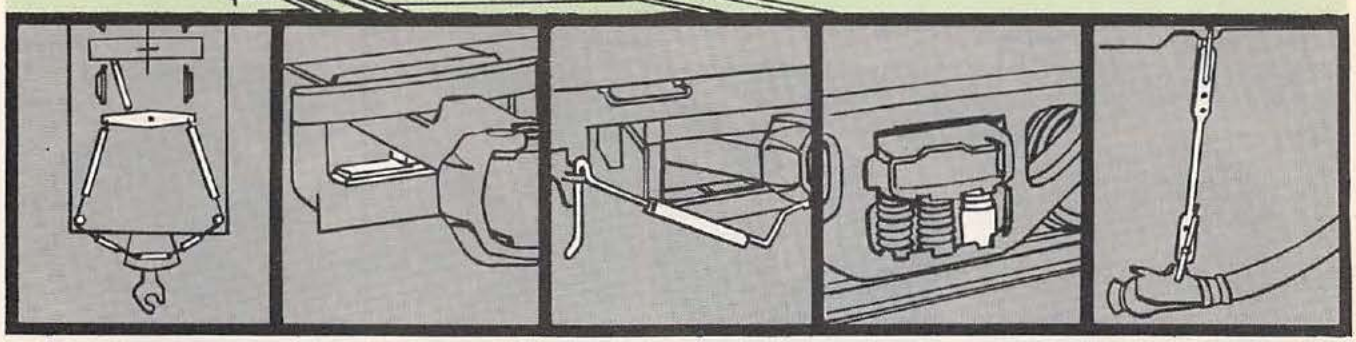
You invest $35,000 or more in a hi-cube car and somebody else tears it up. By-passed coupler damage alone is staggering.

Holland has five products **guaranteed** to drastically cut this and other types of hi-cube car damage.

A Coupler Positioner. A Coupler Wear Plate. An Uncoupling Lever. A Roll Absorber. And a Cushioned Air Hose Support Assembly.

Five simple, mechanical devices. Easily installed and maintained.

And they work. Field tests are proving this.



1. COUPLER POSITIONER*

Centers the coupler to the car as well as the track. A **definite breakthrough.** Responds quickly and automatically, always keeping coupler aligned with track center, whether curved or tangent. Requires little maintenance and can last for years.

2. HOLLAMER™ COUPLER WEAR PLATE*

Non-metallic, non-corrosive and resilient. Friction co-efficient is so low a man can easily move the coupler. With **Hollamer™-to-Hollamer™** contact, service life is longer.

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360,000 of these fully AAR approved volutes are in service, performing superbly under the most demanding conditions. The volute prevents solid coil closure, thus completely protecting springs, which means **less car and track damage.**

5. HOLLAMER™ CUSHIONED HOSE SUPPORT*

Strong and tough, this support stretches as required, **but won't break.** Not affected by extremes in temperature. Installed in seconds without taking the car out of service. Hand operated fasteners. No tools necessary.

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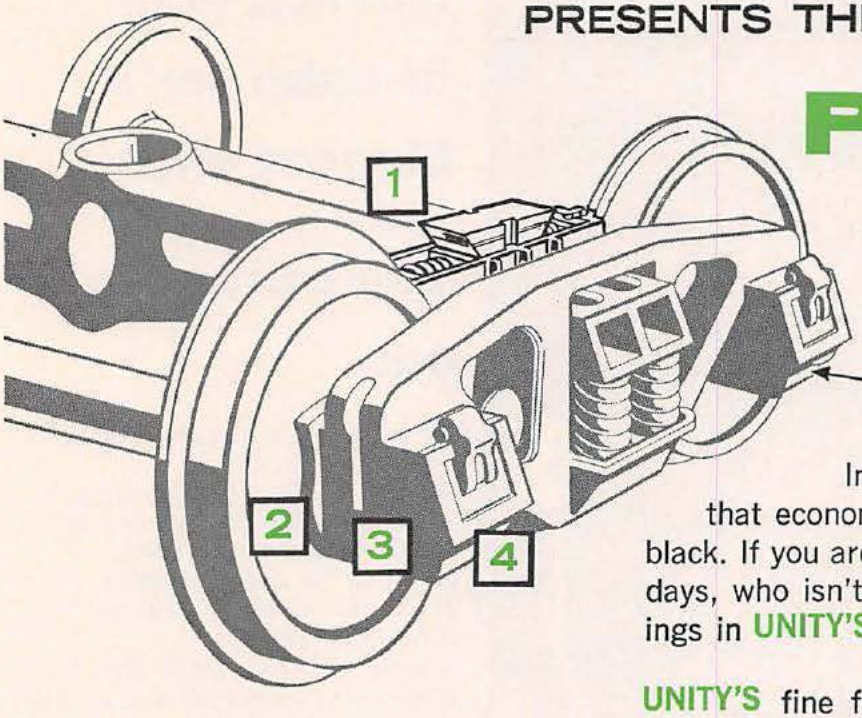

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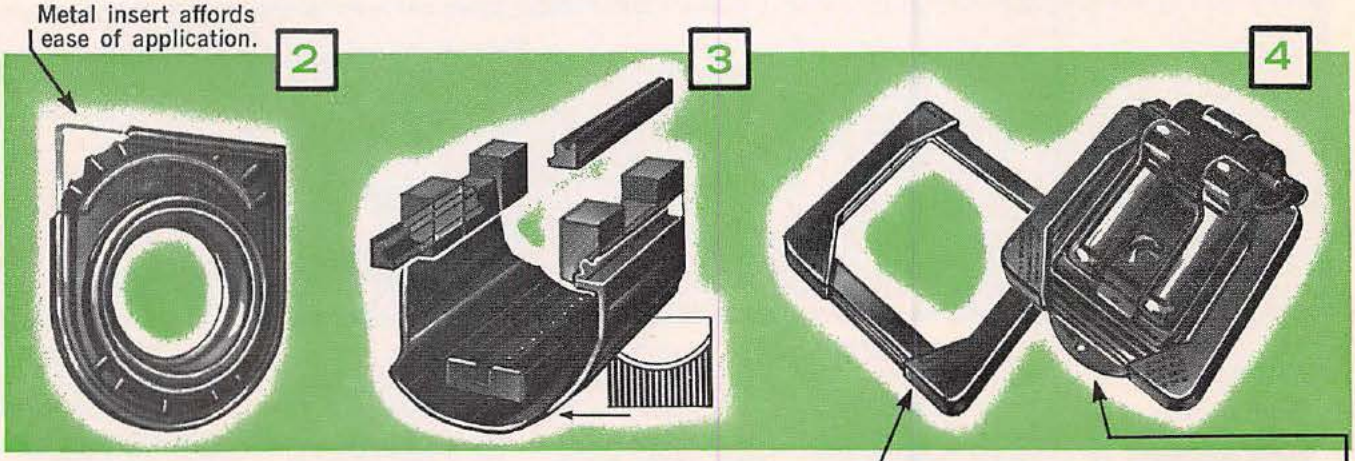

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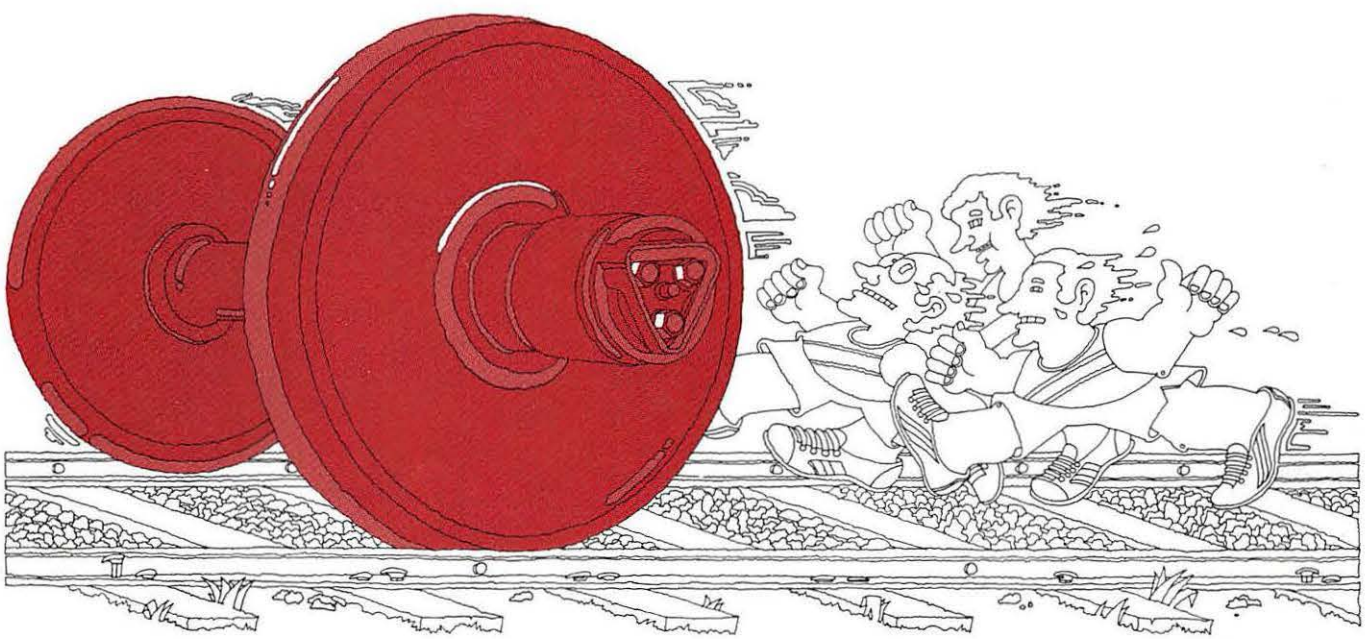

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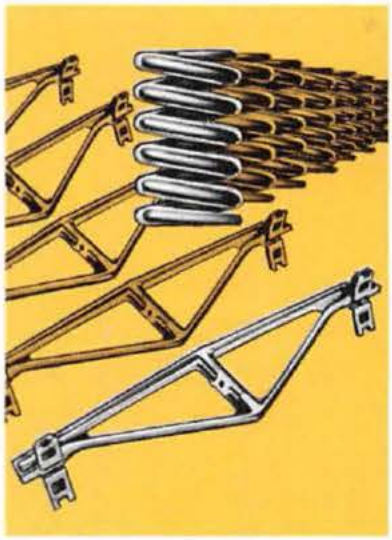

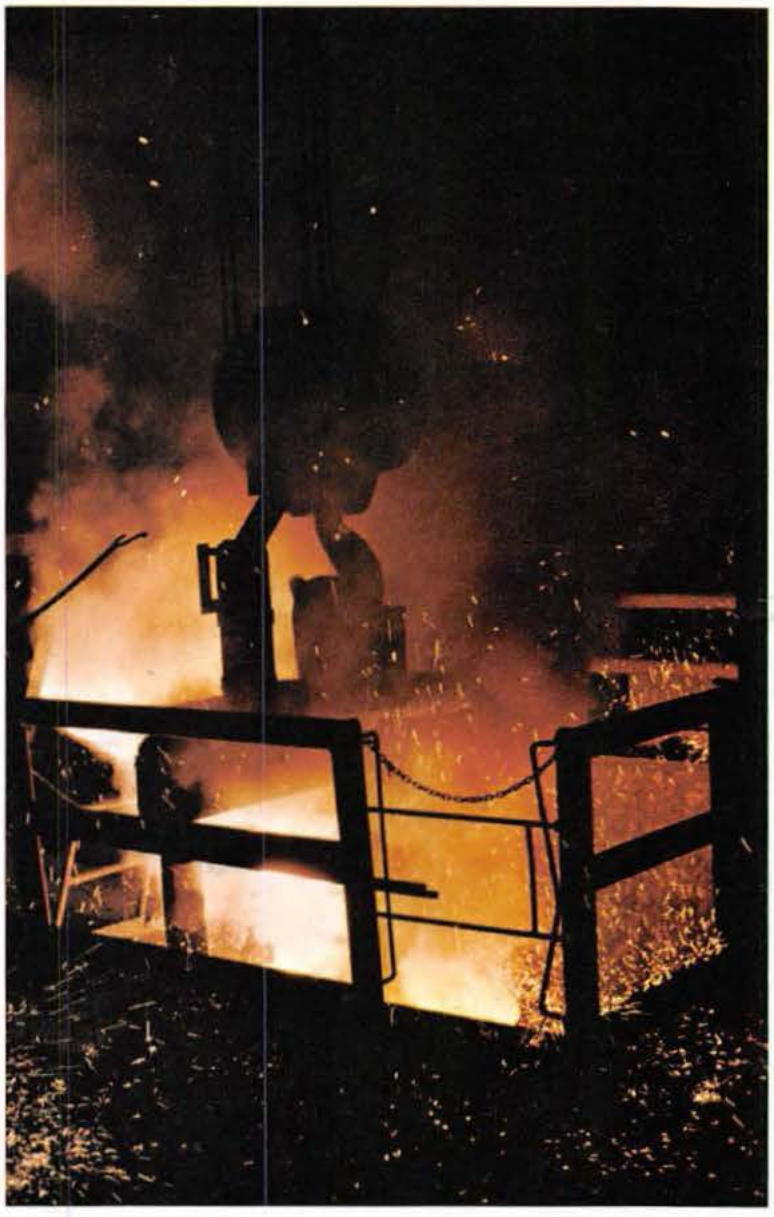

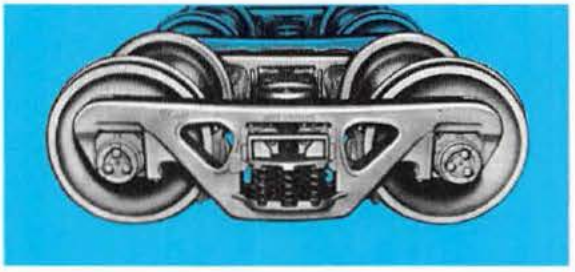

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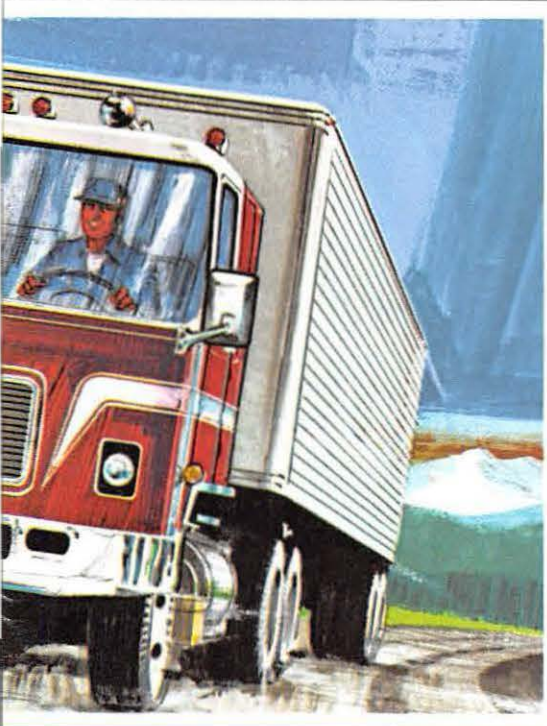

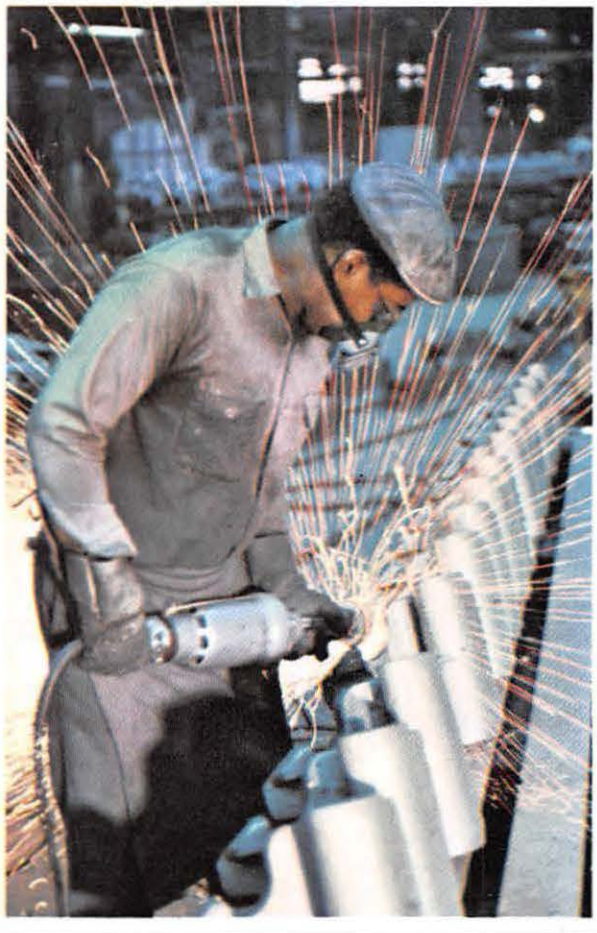

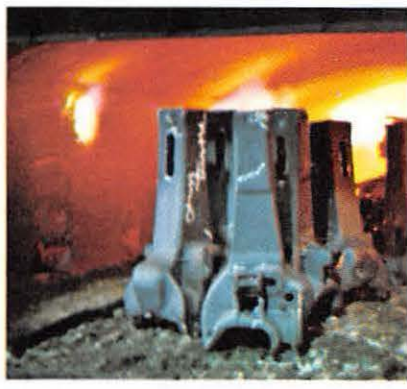

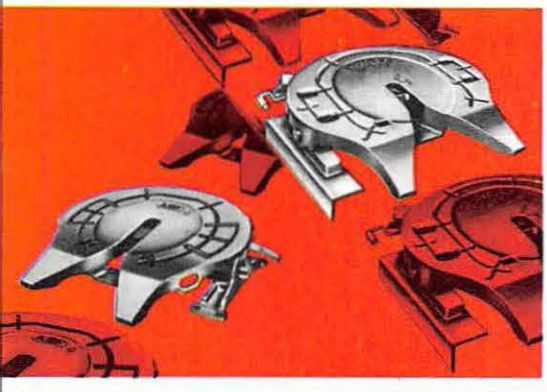

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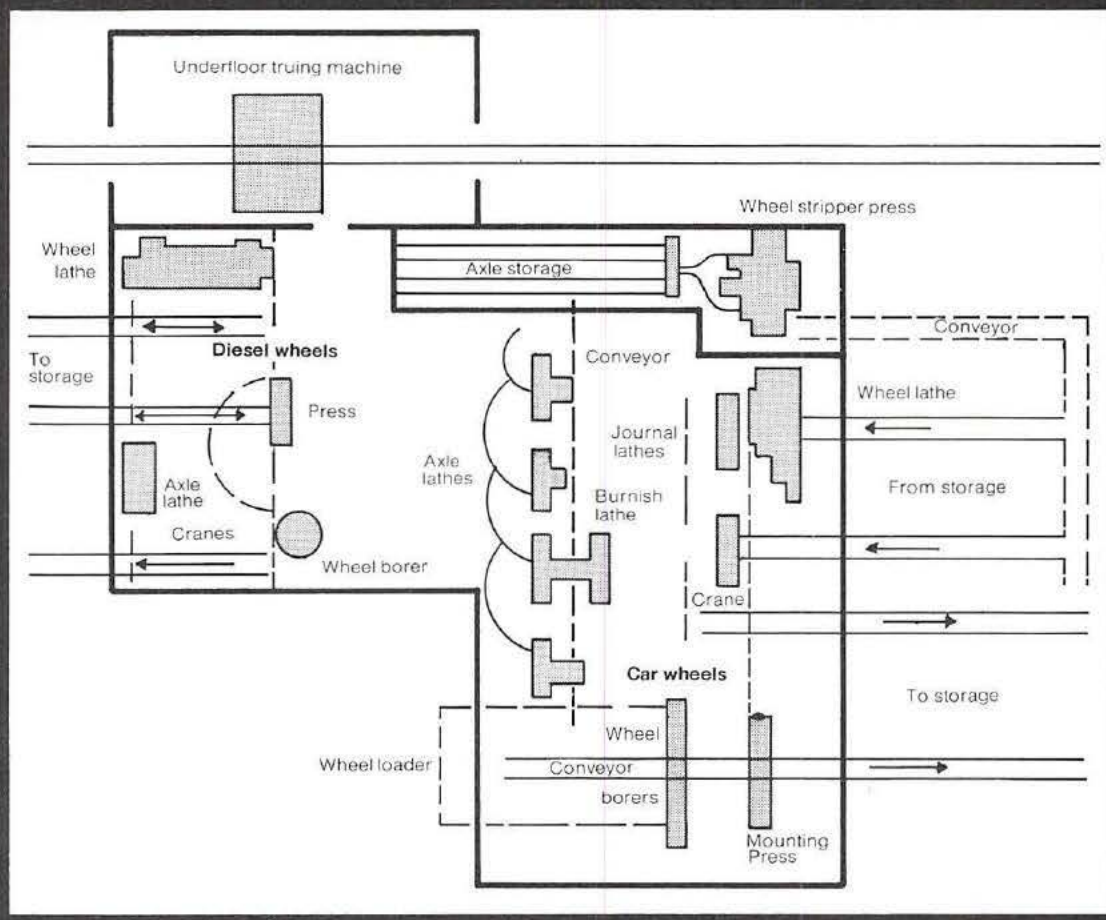

Farrel moves the wheels that move the freight. Automatically.

Progressive management knows that in wheel shops, time is money. The longer your rolling stock is down for wheel and axle renewal, the less time it is out earning its keep. The solution is a profitable maintenance operation.

The above diagram shows how we have solved this problem for several of the leading progressive railroads. Farrel dual end-drive axle lathes, car wheel borers, wheel mounting and demounting presses and underfloor wheel truing machines have been combined into a single, highly productive, completely automated operation.

Nobody has as much experience as Farrel in designing and building completely automated wheel and axle shops. And, we have just as good a reputation for building individual machines.

Farrel has what you need to keep your rolling stock rolling. For detailed information on our complete line of wheel shop equipment, ask for bulletin 1400-A. Write Farrel Company Division, USM Corporation, 565 Blossom Road, Rochester, New York 14610.

FARREL

where railroads shop for machine tools

Farrel Machinery Group

USM Corporation

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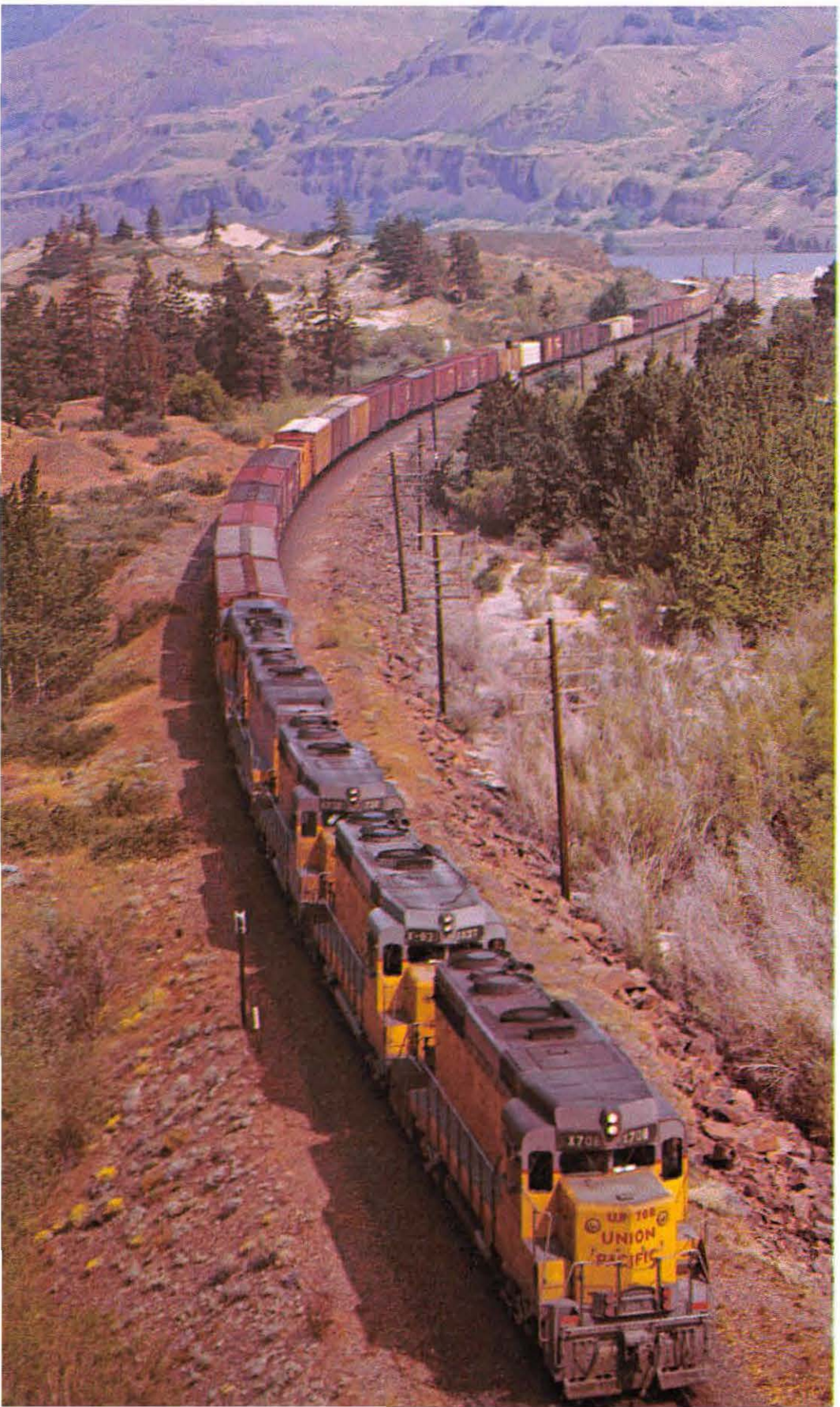
FR-295

Squeezing fresh oranges through the mountains takes a rugged diesel lube oil.



When it comes to shipping produce, there's not much time before a ripe orange turns into a rotten one.

So, precision-scheduled trains, like the Union Pacific's fruit and vegetable express, try to make certain that slip-ups and downtime are minimized.

That's why so many of Union Pacific's heavy-duty locomotives operate with AMOCO® Super Diesel Lubricating Oil.

It's an improved lubricating product, with increased alkalinity to reduce wear in rings and liners, high thermal stability for greater resistance to oxidation, and high dispersancy for longer filter life and cleaner running engines.

Most railway oils meet engine maker's specifications, and pass proprietary tests. They have to. But, some are better. Like AMOCO Super Diesel Lubricating Oil.

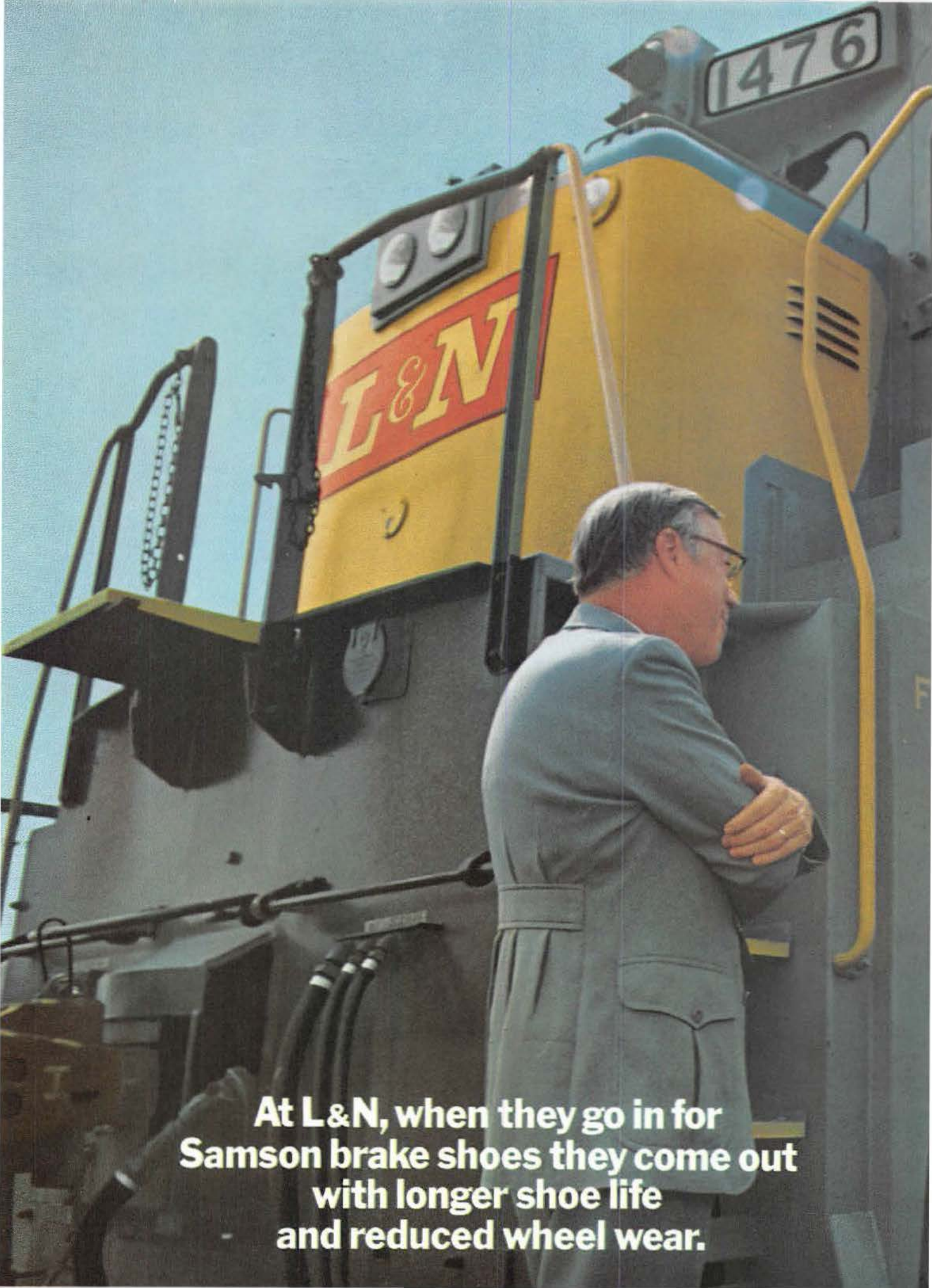
This railway oil was introduced in 1969, and already has excellent acceptance as a "new generation" lube.

If on-time delivery and cargo protection are important to your type of service, AMOCO Super Diesel Lubricating Oil could be the answer.

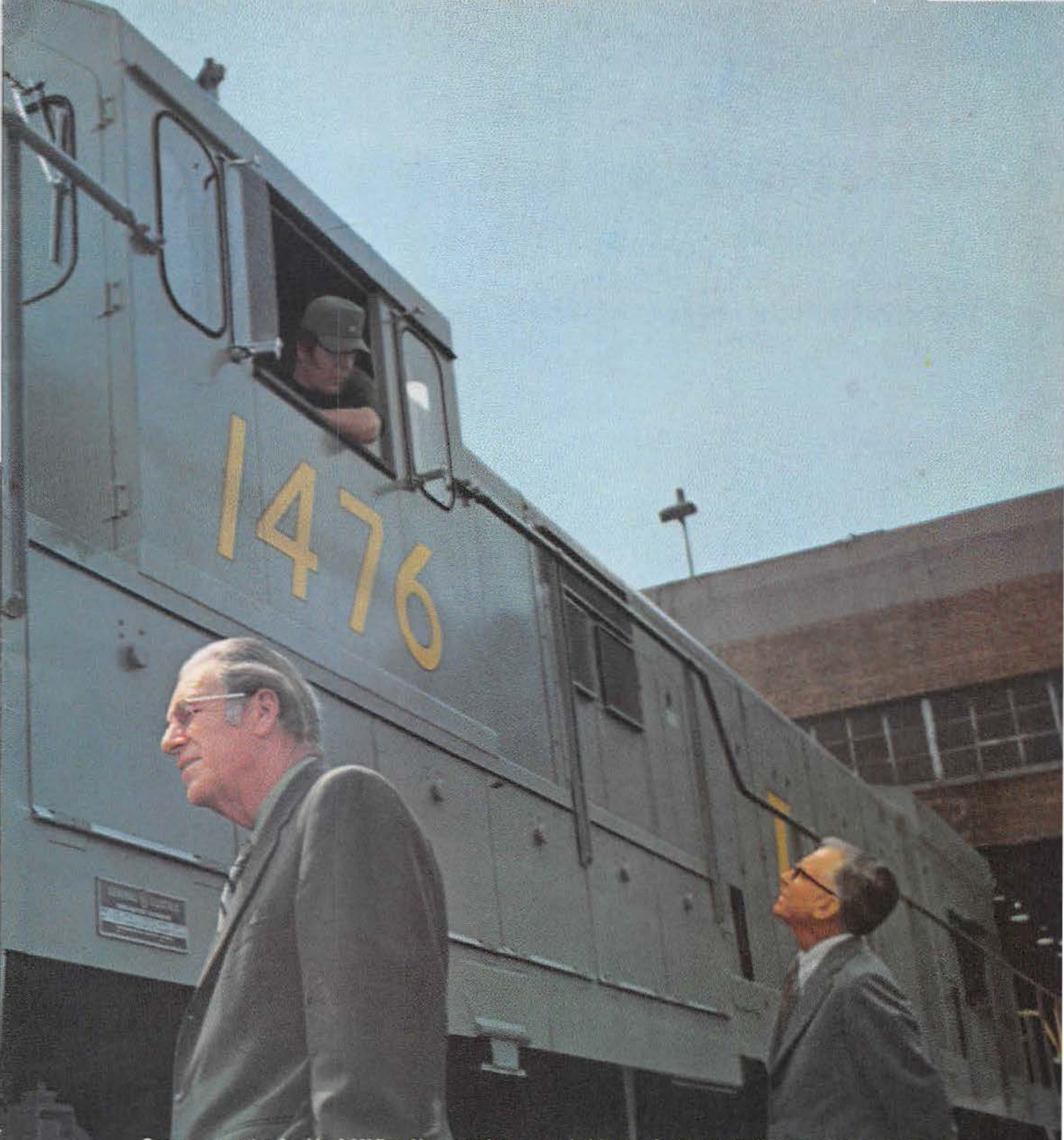
AMERICAN

American Oil Company

Circle 15 on coupon page 81



At L&N, when they go in for Samson brake shoes they come out with longer shoe life and reduced wheel wear.



Samson now standard for L&N Road Locomotives.

First the Samson brake shoe proved itself in rugged service on cars of the L&N's Florence Coal Train operating through the coal fields in Western Kentucky. Locomotive engineers reported better handling... both in terms of shorter stops, and a 12-pound brake pipe reduction as opposed to 20-pounds with standard metal shoes.

All Samson shoes were painted yellow, then weighed and steel-stamped with serial numbers to insure test accuracy. Weight loss, wheel tread wear, and individual car mileage were all tabulated in terms of the Samson versus regular iron shoes. And the Samson gave 1.9 longer shoe life... plus reduced wheel wear.

Then the Samson was tested on L&N road locomotives, and again the shoe gave longer life than regular iron. By switching to Samson on all metal-shoe locomotives, L&N mechanical executives calculated they could save at least $16,000 per year in costs of material and labor. In addition to important bonuses of better braking performance and spark suppression. So they standardized.

If you would like additional facts about the Louisville & Nashville tests, or how the Samson shoe earned AAR conditional approval for interchange, contact your Abex representative. He's a good man to have working on your railroad.

(Left to right in photo) C. A. Love, Chief Mechanical Officer, Equipment; G. H. Kendall, Chief Mechanical Officer, Motive Power; C. N. Wiggins, Assistant Vice President, Mechanical. These 3 key mechanical executives of the L&N, always on the lookout for a better way, standardized on the Samson shoe.

Abex
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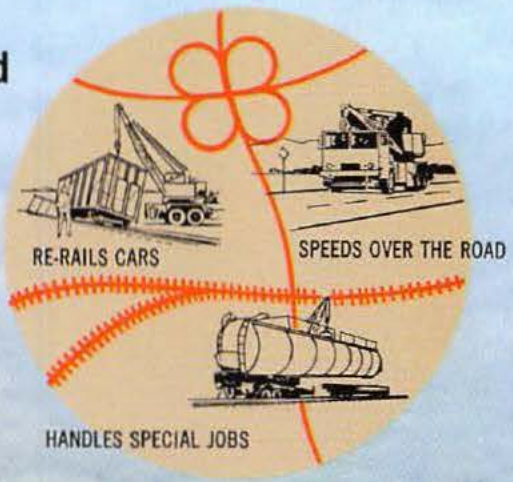
Railroad Products Group
VALLEY ROAD, MAHWAH, N. J. 07430

Holmes Crane Delivers 100,000 lbs. of Lift to Trouble Spots Near or Far

Handles emergencies for CP Rail in and around Montreal and works at the Cote St. Luc Yard adjusting loads, and moving heavy equipment.



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Yes, I'm interested in learning more about the New Holmes RC-60.

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Now-more power to CP Rail...

20% more!

New, improved Holmes Crane puts 120,000 lbs. of muscle on the line!

We've made the best even better! Coming soon ...a new model RC-60 with 120,000 pounds of lift. This unit has 20% more power...more lifting capacity...more versatility...more strength... so you can tackle the "heavyweights" with ease. Watch for it. The first NEW HOLMES RC-60 goes to CP Rail this Fall!

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The angle cock is a common device. There are two on each of the 1.8 million freight cars in this country. We warehouse angle cocks so that you don't have to. Matter of fact, there are over 500 WABCO replaceable parts on a freight car and we warehouse those, too.

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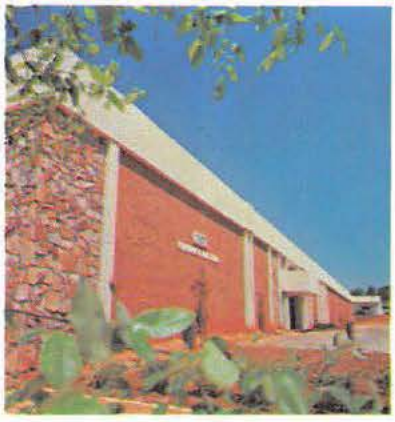
To us, this is one of the ways we earn your business. To you, WABCO inventory control means dollars . . . available dollars that aren't tied up in huge inventories. And yet, you have the replacement parts where and when you need them.

Modern, efficient inventory control is just one of the ways WABCO serves today's railroads. We'd like to give you the whole story. Write: Westinghouse Air Brake Division, Westinghouse Air Brake Company, Wilmerding, Pennsylvania 15148.



Westinghouse Air Brake Division Distribution Center, Chamblee, Georgia serves the southeast with genuine WABCO replacement parts.

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The WABCO Transportation Group is: Cardwell Westinghouse Company, WABCO Monorail Division, WABCO Signal & Communications Division, Westinghouse Air Brake Division, WABCO Ltd., Freios e Sinais do Brasil S.A. WABCO is also 17 European operations and licensees and agents throughout the world.

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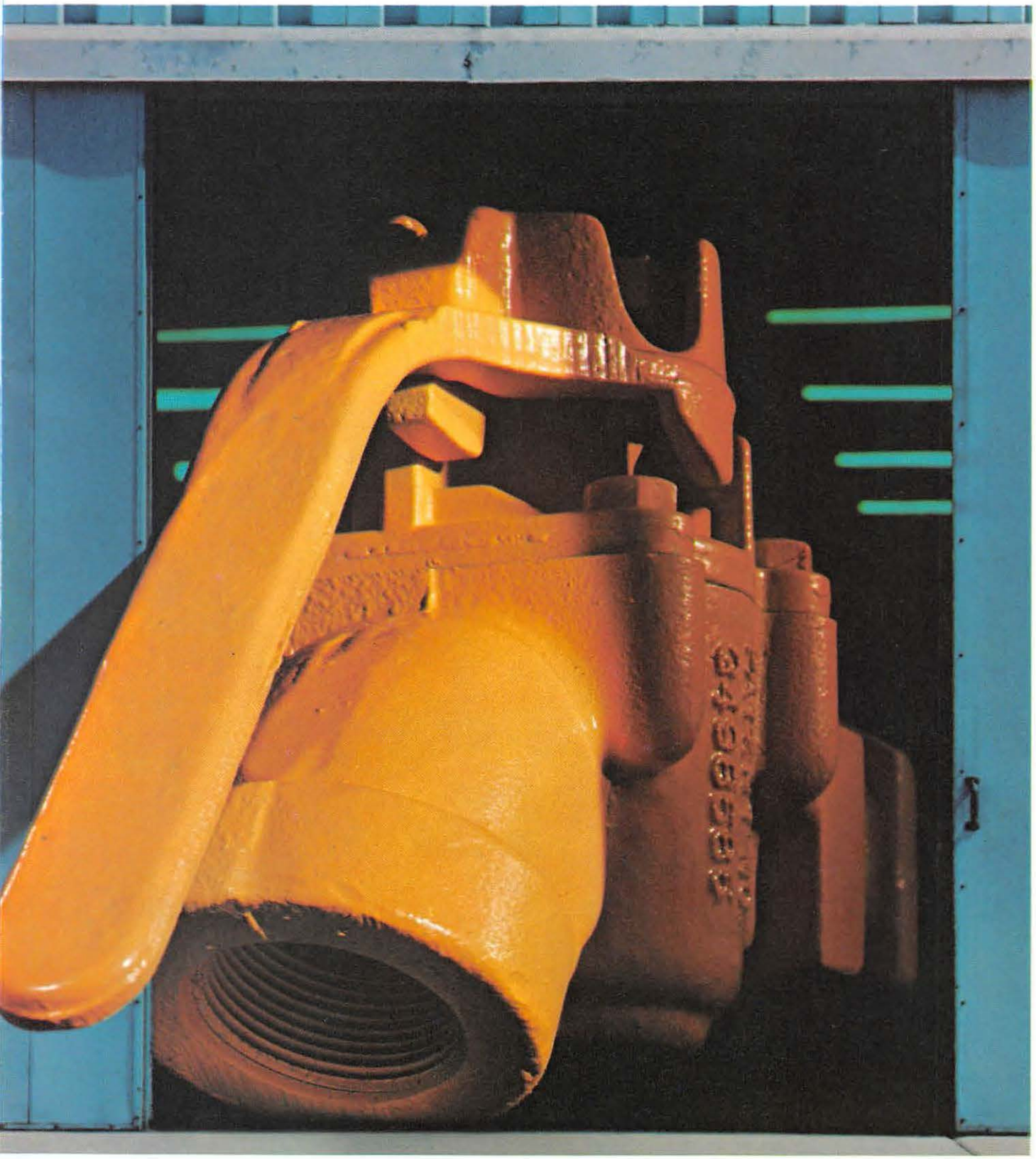
excessive control.



This is the shock absorber that's going to be on future super-speed mass transit. Subways. Monorails... Tomorrow.

This is also the shock—The Houdaille Hydraulic Rotary Shock Absorber—that's now on the Metroliner, the Turbo Train, and a lot of others that are revolutionizing mass transit. Today.

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FUTURE SHOCK

Model STA Switch Electromatic

Model STA Switch Electromatic

The Switch Electromatic features the same heavy duty, high frequency, vibratory drop and squeeze type workheads used on all Electromatic Tampers.

The split head design allows the workheads to be moved laterally, on a carrier beam, and operated individually or together, so all 16 tools can penetrate the ballast at one time, giving a complete and uniform compaction under each tie and under the entire switch area.

When not being used in the switch area, the Switch Electromatic doubles as a production tamper, for smoothing and spotting and as a second machine in a tandem operation.

Using the Junior Foreman attachment, a simple infra red surfacing device, and the Jacking attachment, the Switch Electromatic becomes a one man operation for surfacing out-of-face, joint peaking, and spotting and smoothing track.

The Delta Surfacing Device on the Model STA-JD Switch Electromatic Tamper with jacking and Delta Surfacing device is fully automatic once the jacking sequence has been instigated. The operator is only required to select the specified raise and elevation when necessary.

The system consists of a projector buggy which is moved approximately 100 feet in front of the tamper by light-weight push bar trolleys. A modulated infra red beam is transmitted from one of the projectors, over a shadowboard which is calibrated directly to the top of both rails, into two receivers at the rear of the machine; one over each rail.

The receiver on the grade rail is referenced directly to the top of the rail at the rear wheels of the machine.

The cross level receiver "floats" at all times, regardless of track conditions, thereby maintaining a horizontal position with regard to the opposite or grade rail and maintains a degree of accuracy of plus or minus 1/32 of an inch on the track.

Model STA-JF with Junior Foreman surfacing device.

Switch Electromatic with over-the-workhead jack frame.

The only 16-tool switch tamper

Split head design allows the workheads to be operated individually or simultaneously.

A Tamper PRODUCT

ELECTROMATIC TAMPERS

The three best machines in the track maintenance business.

- Electromatic quality and reliability, proven for a decade.
- Unsurpassed and proven Tamper design features increase the productivity of your track maintenance operation.
- Same proven and accepted Electromatic tamping quality and uniform consolidation.
- Same world proven Electromatic tamping principal and vibrators.
- Best workhead design in the business. Unequalled Electromatic efficiency and quality.
- Best possible track surface quality.
- Longest lasting surface.
- Same patented "Delta" Surfacing Device, accepted and proven to be the best for a decade.
- Same dependable, reliable, equipment and service.
- Unequalled design features include component standardization.
- One man operation.
- Wide range of easily adaptable attachments available for the ultimate in track maintenance performance and operation.
- Options available to increase utilization for year-round operation.
- Increased production and travel speeds.
- Graphliner attachment-one operator can surface, line and tamp track.
- Auto-Graphliner attachment-automatically records the existing curve and lines track to a pre-plotted curve.

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RPI

Autojack Electromatic Model EJ-6

- Highest quality production tamper.
- Fully automatic one man operation.
- Absolute accuracy in levelling and lining with patented "Delta" system and Auto-Graphliner.
- Fully enclosed sound dampened cab with Lexan safety windows.
- Unobstructed visibility.
- Four-wheel disc brakes.
- Complete automatic cycle assures absolute uniform results.
- Production speeds in excess of 1650 ft/hr. Travel speeds to 40 MPH.

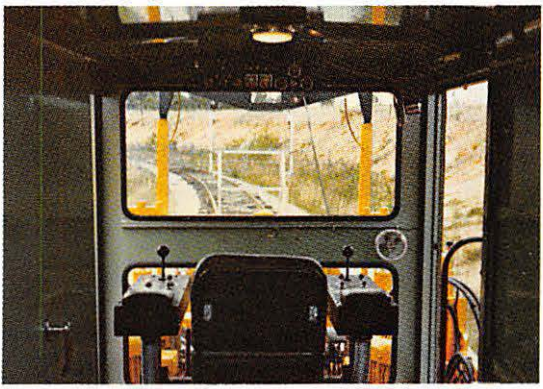
Switch Electromatic Model ST-A

- Same design features as Junior Electromatic PLUS being able to tamp the entire switch, turnout, crossover and ladder track.
- Split head design allows the workheads to be moved laterally on a carrier beam and operated individually or together.
- The STA provides a ballast flow and uniform consolidation in the load bearing areas of the switch.
- Ballast reaches the desired location under the frog, guard rail and all other critical areas.

Junior Electromatic Model Jr-A

- Heavy duty production tamper.
- One man operation.
- Fully enclosed sound dampened cab with Lexan safety windows.
- Unobstructed visibility.
- Travel speeds to 40 MPH.
- Selective gear transmission.
- Four-wheel disc brakes.
- Air/hydraulic, finger tip controls.
- Semi-automatic sequence of operation.
- Tamping speeds in excess of 1000 ft/hr.

- Tamps the entire switch, turnout, crossover and ladder track.
- Split head design allows the workheads to be moved laterally on a carrier beam and operated individually or together.
- The STA provides a ballast flow and uniform consolidation in the load bearing areas of the switch.
- Ballast reaches the desired location under the frog, guard rail and all other critical areas.
- Heavy duty production tamper.
- One man operation.
- Fully enclosed sound dampened, heated cab with safety windows.
- Unobstructed visibility.
- Travel speeds to 40 MPH.
- Selective gear transmission.
- Four wheel disc brakes.
- Air/Hydraulic, finger tip controls.
- Semi-automatic sequence of operation.
- Tamping speeds in excess of 1000ft/hr.



Switch Electromatic cab interior.

- Electromatic quality and reliability, proven for a decade.
- Unsurpassed and proven Tamper design features increase the productivity of your track maintenance operation.
- Proven and accepted Electromatic tamping quality and uniform consolidation.
- World proven Electromatic tamping principle and vibrators.
- Most dependable workhead design in the business. Unequalled Electromatic efficiency and quality.
- Best possible track surface quality that is only attained with Tamper's patented Delta Surfacing Device.
- Longest lasting surface.
- Patented Delta Surfacing Device, accepted and proven to be unsurpassed for a decade.
- Equipment and service, proven dependable and reliable.
- Unequalled design features include component standardization.
- Wide range of easily adaptable attachments available for the ultimate in track maintenance performance and operation.
- Options available to increase utilization for year-round operation.
- Increased production and travel speeds.
- Graphliner attachment—one operator can surface, line and tamp track.
- Auto Graphliner attachment—automatically records the existing curve and lines track to a pre-plotted curve.

Tamp the entire switch, turnout, crossover and ladder track. With one operator.

A Tamper PRODUCT

SURVIVAL THROUGH TECHNOLOGY

The Railroad Nobody Knows

It is the railroad America could have-based on equipment now available from suppliers

By GUS WELTY Senior Editor

Scattered around the country today are the makings of super-railroads—the real thing:

The freight classification yard that's as automated as computer technology can make it and as labor agreements will allow it to be.

The freight car fleet with just the right balance to meet shipper needs, a car fleet that rides on roller-bearing trucks and has the kind of damage-prevention gear that will give the customer's freight a gentle ride.

The locomotive fleet that's young, wide-range in its capabilities and as maintenance-free as the builders can yet make it.

The line of road that has a minimum of killer grades and restrictive curvature.

The communications system with capacity for today and tomorrow.

The signal system in which signals, passing-track layout and train-operation concepts are blended into a smooth-running whole.

The track that adds to that gentle ride.

The information system that has record-keeping down pat and, most important, provides timely and accurate data feedback to help operating managers better plan their operations.

The locomotive maintenance/repair facility that keeps the motive-power fleet where it should be, which is out on the road working.

The car maintenance/repair facility which does likewise.

The power and car distribution system that gets maximum utilization out of available equipment.

From the technological standpoint, it all adds up to super-railroads—the real thing.

Somewhere, each of these super-railroad ingredients—or something pretty close to it—can be found today.

The problem is that no railroad has them all. To be frank about it, not many railroads even have very many of them.

What this means, essentially, is that while the forecasters are projecting tremendous growth in transportation demand, while railroads themselves are trying to gear up to help meet this demand and while shippers are worrying about how they're going to move their increased production, railroads can't even make full use of the best that's available today.

There are a number of reasons why today's railroad runs behind the capability it might have with today's technology. In many cases, railroad men are convinced that they have not yet been able to use what they already have to best advantage—and, therefore, there's not much sense in piling new technology on top of the under-used

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technology. A point can be made, too, for the argument that there ought to be improvements in the human factors—improvement of management, upgrading of skills, restructuring of work concepts and rules—before any new technological plunge is taken.

Admitting the validity of these concerns, there is another which is pervasive—and which could continue even if and even after railroads improve their use of what they have and win improvement on the human side. That other concern is money.

In part, the dollar problem is one of supply. In part, it's one of supply vs demand.

On the supply side, there is probably no real problem in finding money to put into equipment. That is mainly a matter of being willing to pay the price. But for improvements which railroads prefer to or have to finance through generated capital, there is a real problem. Like everybody else, railroads are caught in the inflationary spiral—particularly where wage rates are concerned. Earnings are inadequate. And it is impossible to pour 100% of earnings into improvements, no matter how desirable they might be, because something has to be turned back to a company's owners—or else present and potential owners will get discouraged, sources of capital will dry up and money will become even harder to come by.

On the supply vs demand side, there are real problems on establishing priorities—and the suspicion remains that in a number of cases railroads still lack adequate tools for making the measurements which should be made before priorities are decided. Of course, priorities wouldn't be so important if the money supply were bigger. But it isn't, and there is very little indication that the financial squeeze will ease in the near-term future. It could get worse.

Over a period of years—the past 10 or so years especially—railroads have worked themselves into a perplexing imbalance. Equipment money has been available, customers have been clamoring for more and bigger cars, railroads have tended to take the money and invest it above the rail. Result: An investment-starved fixed plant has taken a battering from rolling stock that is ever-bigger, ever-heavier.

Trends in railroad spending and in railroad application of technology have also had adverse effects on the supply industry—effects which are not likely to pass away overnight even if the railroad financial picture should brighten up. For instance, there is little incentive for a manufacturer to pour precious R&D funds into development of new equipment, new devices, which railroads can't buy. Only the biggest of suppliers—or the smaller ones willing to take a risk—can afford the kind of R&D which is admittedly needed if late-20th Century railroads are to be technologically competitive with the other modes of transportation. To their credit, a number of manufacturers are going ahead, at least in part, on faith.

Beginning in a formal way with the ASTRO program in 1970, railroads—weighing the future and finding it wanting—have been trying to involve government in what is essentially a national problem: development of a sound transportation system. ASTRO begat the Surface Transportation Act—helped along by the cooperation of other modes. And Congress has done a rather thorough job of hearing the surface-transportation industry's arguments, along with those of DOT/FRA which are parallel only in part.

Government, like the generous giver on tag day, seems to be able to dig deep for almost any "worthy" cause. Railroads have established a case for "worthiness." But government, up to this point, has managed to do precisely nothing. One measure involving assistance in the financial area has gone far enough to make a vote in this session of Congress conceivable—but the strings attached to even that measure are hamstrings which, it's said, would turn growth- and profit-oriented managements against the use of the loan guarantees proposed.

Of course, the very fact that government is being asked to involve itself creatively has had side effects—reflected to a large extent in a tailing-off of equipment orders. Current forecasts are that railroad capital expenditures for 1972 will be higher than they were last year. But that growth certainly does not show in the builders' freight-car order books, and this is perhaps only natural: What management can afford to go charging ahead with higher-cost financial commitments when government is pondering programs which might produce lower-cost financing? It's true that present signs indicate that the logjam on orders may slowly be breaking up—because of a conviction that government isn't going to act and/or a simple need for more cars. Even so, there is probably no way that orders this year will come on strong enough in the fourth quarter to bring the total up even to last year's unimpressing total.

And, unfortunately, still another factor has to be added into the equipment equation—and that's the factor of equipment profitability per se. It's difficult enough, many times, to prove the profitability of expensive but assigned and controllable equipment. But, some say, under the present per-diem setup it's almost impossible to show any profit-in-ownership for less-expensive but free-running general-service cars. And when money costs a lot, it's a gambler indeed—maybe a poor gambler—who will throw his company's bread upon the waters and hope.

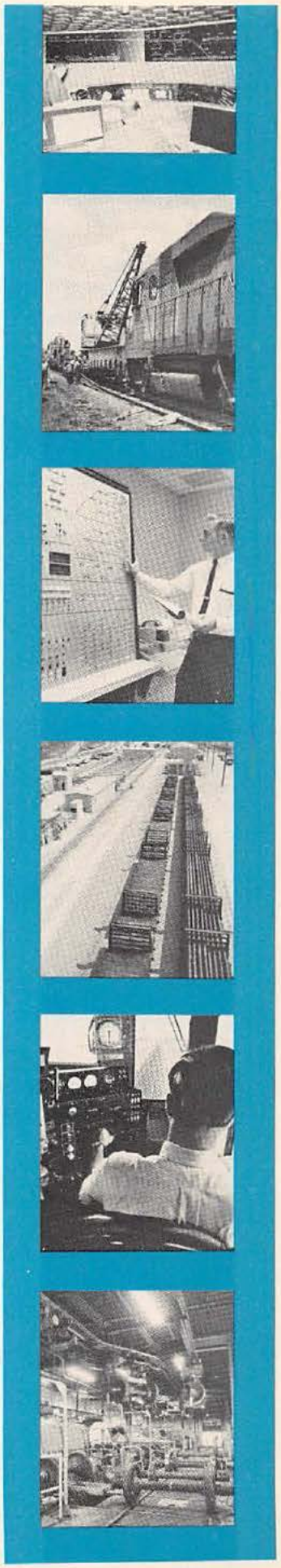
Nevertheless, as time marches on so does the technology of railroading, and this is one area where government is lending a hand—principally through R&D activities at the Pueblo, Colo., test installation and through the track-and-roadway R&D program along Santa Fe in Kansas.

R&D in the private sector is somewhat less visible but no less important. Much of it, of course, is geared to improvement of service and safety of operations. But much, too, is aimed at economy: In other words, it's aimed at helping a railroad recover a part of its outlay through reduction in other expenses. One case in point: EMD's modularization of electrical controls in its newest diesel-electric line. This represents technological progress through simplification—and it's a kind of progress also being made in the track-equipment field, where controls are being simplified as an aid to both those who operate and those who maintain the equipment.

In the terminals, there have been consistent improvements in the basic technology of break-up and make-up of trains—a technology which may hit a new peak when Southern Pacific gets its new Colton, Calif., Yard in full operation. One key to improved yard operations, in all major yards recently built, is the process-control computer—which provides the controls for yard operation at the same time it handles the management-information function.

As for the train itself, critics argue that basic technology isn't much different from what it was 50 years ago—a different form of motive power, bigger freight cars and better equipment components, but still the same basic technology. At bedrock, the critics may have a point—but that's not to say they always will. Take for instance the so-called coaxial-train concept developed and put in model form a few years ago by Santa Fe: There are no coaxial trains running today—but it seems almost certain that a prototype will in fact be built. And only time and a lot of testing will tell where that intriguing concept may lead, in the development of tomorrow's railroad.

Another point might be made, incidentally, regarding the critics' contention that nothing much has changed, and that point has two parts: (1) The basic principle of the railroad is and always has been sound; and (2) contrary to popular belief, railroads have done a tremendous job of building operational technology onto that sound basic principle. To put it another way: Since World War II alone, what



other major American industry has so completely renewed its operating tools?

Comments about "sound basic principle" and "operational technology," however, are the positive side of the story. The negative side is, simply, that railroads have not been able to find the necessary dollars to do the plant-upgrading which will be needed.

Over the next few years, property *maintenance* expenditures will be rising. That's almost inevitable. But it is far less certain that there will be any significant increase in property *improvement* expenditures. And this means that 20th century railroads—going on 21st—will still be operating over the grades and curves laid out by 19th century engineers.

20th century equipment on 19th century lines

A couple of things could happen to change this somewhat-depressing situation. Government could decide that it's time to equalize—one way or another—the public spending for transportation right-of-way improvements. Government could also decide, as the railroads already have, that it's time to ease restrictions on abandonment of little-used rail lines—and the resulting savings could be put to use in improving main lines. Unfortunately, in the absence of either or both of these governmental decisions, there is only the remotest of chances that the industry will be able to put present and new technology to work to raise the plant to super-railroad standards.

There is, of course, yet another technology-related problem which railroads are only now coming to grips with. That's the problem of interfacing technology with people—and it shows up most clearly in the area of computer technology.

Some roads—Norfolk & Western is an outstanding example—are putting maximum effort into both aspects of the interface: (1) Development of the type of output which helps a manager to manage, without burying him under paper; and (2) education of operating supervisors, down to the first level of supervision, in the requirements of input and the uses of output. As an industry, though, railroads still have a long way to go before the computer will really be a positive force. As just one for-instance: Computers have been around the railroad for a good number of years—but in all too many cases, the people who write the programs and the people who both furnish input and are supposed to use output are unable to communicate.

Similar difficulties exist—perhaps less obviously—in such areas as maintenance-of-way and maintenance-of-equipment. And what it all boils down to is this: All the advanced technology in this world or any other will not (1) help a railroad man do a better job, or (2) give the customer better service, or (3) make more money for the railroad—unless people know how to use technology to best advantage.

What it takes to build the "super-railroad"

So, a drive for super-railroading is really two drives: In parallel, a drive toward ultimate technology and a drive toward man's ultimate capability to use that technology. It won't work, any other way.

But make no mistake: In bits and pieces, scattered around here and there, super-railroad technology is available. There are places where it's out-of-phase and there are places where it still needs to be elevated to higher planes. In raw form, it exists. What remains to be done is the bringing together, the refining.

And what is "the railroad that nobody knows"? It's the railroad that has never really been allowed to take shape—the railroad that could be and should be but isn't and won't be until a nation-in-need decides that it's time to permit it to be.

Then, that nation-in-need might find out what efficient, low-cost transportation is all about. Then, rail managers might be able to look ahead, instead of constantly having to look back to see who's gaining on them. Then, all the transportation technology that has been and can be developed might be brought to bear to solve the nation's transportation problems. Then, we might have the super-railroad—the real thing.

INTRODUCING...
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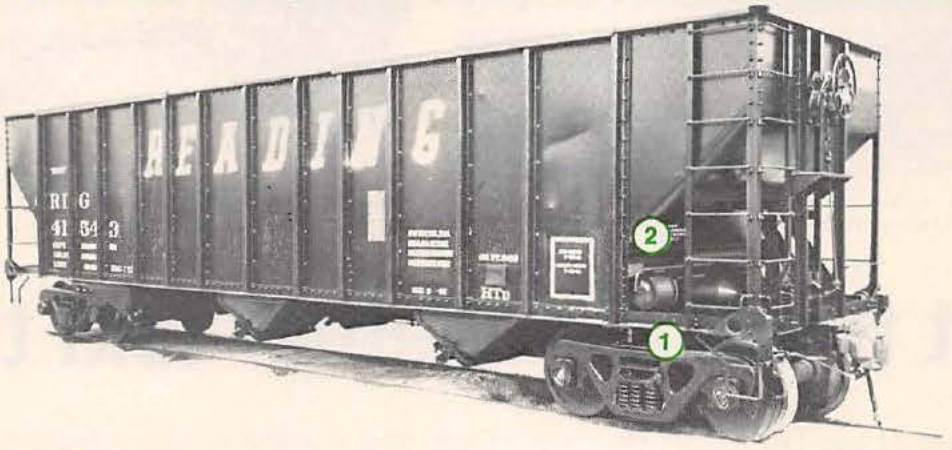

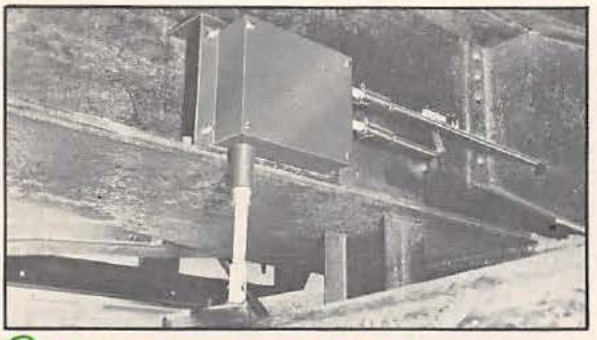

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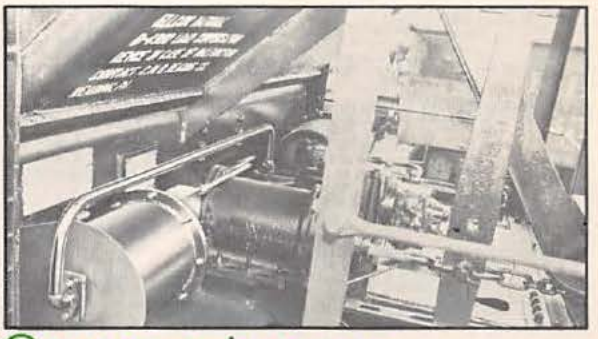

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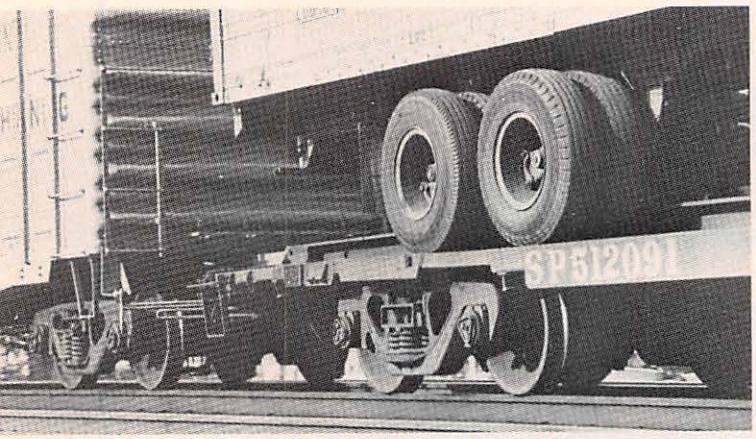

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Efficient use of available mechanical technology can mean survival for more than the railroad industry alone.

By FRED HOUSER, Mechanical Editor

In the not-too-distant future the government may again be giving "E" awards. Hopefully not for excellence in war production but for conservation of Energy and Environment. Both have recently emerged as major areas of national concern.

In conserving energy and environment, there is nothing as effective in the transportation realm as today's freight train. And nothing in prospect that can even approach it. No need for new technology—no Wankel engine, no filament-wound plastic structures, no exotic alloys. Just more (and better utilization) of what we have right now.

● **National concern.** Belatedly this is sinking in on the highest levels. A study of energy conservation, prepared by the White House Office of Emergency Preparedness, suggests that the Federal government encourage more intensive use of rail systems for moving both freight and passengers. One of three "significant" new conservation measures in the study calls for diversion of intercity freight from highway to rail; shift of intercity passengers from air to rail and bus; and transfer of urban riders from autos to mass transit.

The Nixon Administration conservation study is one of several which will form the basis of recommendations for a broad energy policy to be followed for the coming decade. Such a policy is expected to be proposed to the President in the next few months.

The fuel economy of the diesel engine in freight service seems to render it invulnerable to inroads of other prime movers. Even the nation's largest locomotive builder has looked long and hard at three possible contenders and shelved them (RA, Aug. 28, p. 28). But—

● **Electrification.** The same rising fuel-cost trend which brought retirement for the world's only fleet of gas-turbine electric freight locomotives is becoming a matter of concern for diesel operators. And in the decade ahead when national policy may establish the patterns for consumption of energy and control of atmospheric pollution, railroads could emerge as the consumers of central-station-generated electric power distributed by catenary to completely smokeless motive power units. The consumption of fossil fuels would be left to the air and highway modes which seem far less capable of utilizing energy produced by nuclear power stations.

The financing of catenary for electrification of railroads presents major problems. By next year the Black Mesa & Lake Powell, a private coal hauler under construction in Arizona, will demonstrate the 50,000-volt alternating-current technology which is seen as having great potential for future U.S. common-carrier railroads. A shorter 25,000-volt, fully automated line in southeastern Ohio, owned by a utility and transporting coal, has done much to demonstrate the technology of electrification. Thyristor controls have also been proven in service and are ready for application in domestic heavy traction.

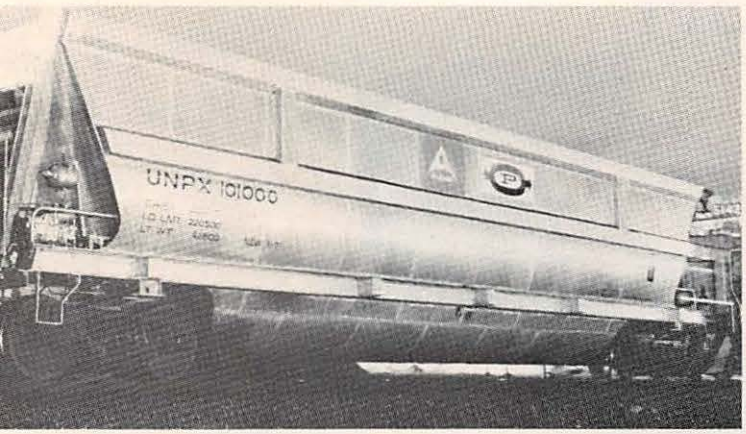
● **Reliability, maintainability.** Right now there is ample evidence of a new level of quality in diesel locomotive production. Builders are emphasizing the reliability of their new units.

Certainly locomotive manufacturing and maintenance facilities have been transformed from job shops to full-scale production lines. Component replacement and unit exchange have completely altered the philosophy of locomotive repair.

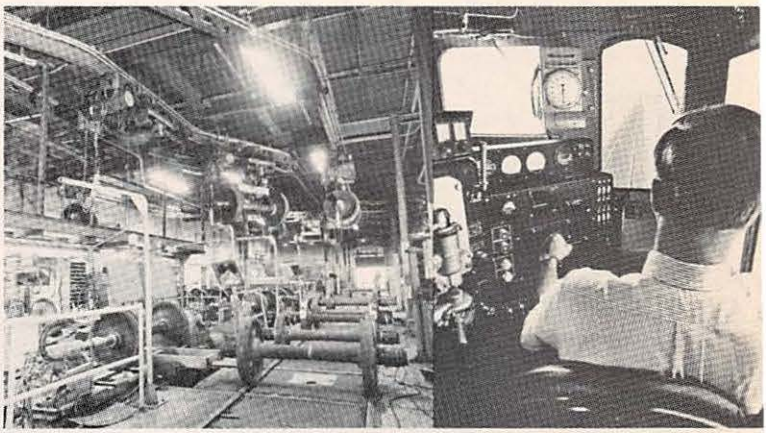
Spectrographic analysis of crankcase oils, radioactive analysis of engine component wear, automated diagnostic testing and computerized locomotive component records are giving motive power managers the real power to manage. Today railroads have the ability of having their maintenance programs manage their engines, rather than having the engines manage the program. Today locomotives are predictable, productive power sources. Only a shortage of capital prevents massive re-equipping with motive power which can return more on investment than did the original diesel locomotives over the steam engines they replaced.

● **Freight cars.** Evolution of the freight car has not been marked by any single innovation comparable to the effect the diesel locomotive has had on motive power. Certainly many of the technical problems involved in operating the latest cars are the result of financial and regulatory influences.

The fact that each car is part of a large fleet in interchange over the nation's railroads enforces a degree of compatibility which makes sudden design changes difficult. Adoption of the air brake, the automatic coupler and the roller bearing have involved long and planned conversion programs. In fact, many of the attempts at modernizing the car fleet have involved only the



But the special shipper can't be ignored; only specialized cars can retain his traffic. One-fifth of today's cars are privately owned.



The best equipment is only as good as the men and machines that keep it in running order. . . .and the men trained to operate it.

up to "super-railroad"

so-called specialty items, with too little attention being given the car structure.

Seaboard Coast Line's L.A. McLean, engineer of car construction, recently told how the decision of his road's mechanical department in the 1950s to spend $700 to $900 more on each new car is paying off today in terms of a fleet that is remaining in service with virtually no heavy repairs short of damage in derailments. "The lowest cost car meeting AAR specifications may not be the least costly piece of equipment over its life span," observed McLean. "Careful evaluation of each component and method of car assembly can mean vast differences in maintenance costs. It can provide us with equipment that can serve its purpose for 15 years and then be retired, or should circumstances warrant, rebuilt."

● **Where it counts.** A staff analysis for the Senate Commerce Committee points up problems which have seen diversion of large amounts of high-valued traffic to trucks. "Since the great bulk of gross capital investment by Class I railroads is in equipment (with freight cars accounting for half the total), railroad efficiency is largely determined by the intensity with which rolling stock, especially freight cars, is utilized to generate revenue. By some tests, there appears to have been improved utilization of freight cars in the last ten years, but close examination reveals that there has been little, if any, actual improvement. . .With an average of less than 20 trips per year, average revenue utilization per freight car is only about 5% of its potential. This low rate of utilization is just about the same as it was a decade ago."

"The speed of the average freight train has remained unchanged over the course of the decade. . .While there has been no change in the absolute number of loaded car miles since the early 1960s, there has been a drop of almost 7% in the percentage of total car miles that are loaded. These two measures indicate that there has been an increase in empty back-hauls, probably resulting from the introduction of unit trains and the use of other specialized (and often shipper-committed) equipment. One implication is that by being more responsive to the demands of particular types of shippers and supplying them with specialized equipment, the railroads have suffered penalties in efficiency and capital productivity."

● **A 3-D approach.** A few years ago a Southern Pacific spokesman noted the attention which is paid to cushioning longitudinal shocks in rail freight transportation, with relatively little attention being given to vertical and lateral cushioning. Certainly two levels of protection are now being provided in freight cars for end-to-end shock protection—the conventional draft gear which adequately protects the car structure for those vehicles which carry bulk loadings that are unaffected by train slack action and switching impacts, and the long-travel cushioning which protects fragile ladings and, in so doing, protects the car structure.

While this type of investment has been justifiable, it does not yet seem that railroads are ready to adopt a similar philosophy in selecting running gear. Certainly there are car trucks which would give better vertical and lateral cushioning to fragile ladings. Like the more sophisticated cushioning arrangements, better trucks cost more and have not been adopted.

A more prosperous industry probably would not have had to adopt a program which promises another decade of large-scale operation with the solid journal bearing. Roller bearings are now on some 40% of the car fleet and U.S. and Canadian railroads had a record of over 2.1 million car miles per hotbox in 1971, an all-time high. A decade earlier it had been about 300,000 miles. Meanwhile, there has not been a corresponding decrease in the accidents caused by this defective condition. The National Transportation Safety Board recently recommended that the Federal Railroad Administration "promptly publish the current study of the failure of freight car journals, and if necessary, continue such studies so that regulations can be promulgated to establish standards for freight car journals and their maintenance."

For a time, manufacturing capacity limited the application of roller bearings. Currently, however, over 750,000 cars have these bearings. Soon a point will be reached when the inspection and servicing of solid bearings will make necessary a rather thorough study of the economics of continuing them in service.

The Senate Committee study well summarizes a series of situations that are exemplified by this roller-bearing conversion problem. "Not only have the railroads had to make such investments on their own," said the report, "but they have had to tackle what is essentially a systems problem through piecemeal investment approaches."

So what does it all add up to? The technology for the super-railroad is here. What is lacking is the means to implement it system-wide. Finding those means is the primary job right now of all who would keep railroads free.

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CONTINUOUS WELDED RAIL may be the most important cost-saving feature of track design developed in the past 50 years.

M/W tools promise big savings

By MERWIN H. DICK, Engineering Editor

Technology in the design and maintenance of railroad track has already been brought to a high state of development. But, that technology is in a state of constant improvement, a fact which assures that the technological tools for building and maintaining durable track will be available for the use of future generations of track engineers.

The main concern right now, however, is whether railroads are making maximum use of the technology that is available today. The question is especially pertinent in view of several important considerations, one of which is the ever-present need for maximum economy in track maintenance.

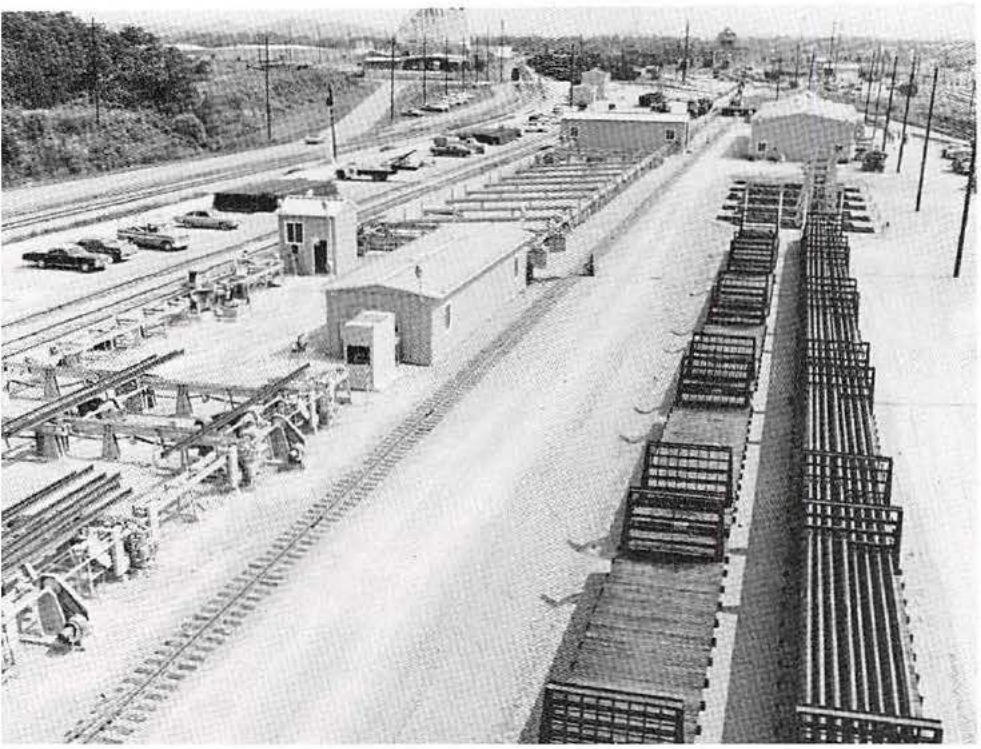
Another is the reality of the FRA track safety standards. Whatever the present state of those standards may be, the fact is that railroads will ultimately be faced with the need to comply with them, perhaps in modified form compared with the standards as initially issued. In other words, after the present period of seeming hesitation and indecision is over, the standards will become a hard reality. Compliance is almost certain to result in bigger maintenance-of-way programs on most railroads. The question is whether the railroads as a whole will be able to carry out the enlarged programs with optimum economy, that is, by making maximum use of the technology that is available today.

● **Dramatic results.** That technology, let it be said, has reached a higher state of development than ever before. And that applies both to the design of the track structure and to the machines available for track maintenance. The progress made in both fields has taken place quietly and without fanfare. The results, nevertheless, are of a dramatic nature and deserve more credit than has been accorded them. But the benefits must still be listed in the potential column, to the extent that the railroads, primarily because of financial considerations, have not been able to take full advantage of available technology.

Continuous welded rail is probably the most important cost-saving feature of track design to be developed in the past 50 years. Many roads have embraced CWR and are reaping savings amounting, by their own estimates, to

JOINTED RAIL STRINGS released from Union Pacific track are loaded intact on a rail train and taken directly to the point of relaying.

M/W TECHNOLOGY ADVANCES...



RAIL-WELDED COMPLEX of L&N at Nashville, Tenn., has advanced equipment for handling, classifying and welding rail into long strings.

...ON ALL FRONTS

TRACK-ANALYZING CARS may come into wider use as need for precise track inspection becomes pressing under FRA Track Safety Standards.

$198 to $1,200 per mile per year. But CWR has not been universally adopted by the larger roads and to that extent the industry is not reaping the full benefits of potential savings.

● **Remaining joint effects.** While CWR eliminates most of the joints in track (the main source of expense in track maintenance) the matter of insulated joints and bolted joints at frogs remains to be dealt with. The cost of maintaining insulated joints has been estimated at up to $250 per joint per year. Until recently the problem of reducing this cost has resisted all efforts to solve it. But now has come the so-called "glued" or bonded joint utilizing either special fastenings or high-tensile bolts. As more railroads take advantage of this new advance in track technology, the savings through reduced maintenance costs at insulated joints will be extended.

Elimination of the joint effect at frogs appears to be largely in the future. True, a few roads have adopted the practice of making field welds at these locations and others are experimenting with bonded joints, but these efforts are still in their infancy.

● **Economy in rail handling.** There are other techniques having to do with CWR that appear to have advantages. One is the type of advanced rail-handling, classifying and welding plant Louisville & Nashville placed in operation at Nashville, Tenn., last summer. The use for the first time of a computerized ultra-sonic system for classifying secondhand rails is one feature of this installation. Another is a system that causes the rails to be kicked automatically from the main conveyor onto skid tables according to their classification. The installation also has a specially-designed traveling gantry crane and the latest equipment in the welding production line.

Purpose of the L&N's plant at Nashville is to provide a means of handling both new and secondhand rails with maximum economy through the receiving, classifying, cropping and welding procedures. It is reported to be working satisfactorily. Other railroads are known to be considering similar installations, but so far as is known, none has made the decision to go ahead.

Still other techniques aimed at reducing the cost of handling long strings of rails, especially jointed strings, have not yet come into wide use. On the Southern, for example, equipment is in use for picking up long, jointed strings of secondhand rail in the field and transporting them to a central location where the strings are dismantled and the usable rails are cropped and welded for further use. In a variation of this technique in use on Union Pacific, the long, bolted strings, after being picked up in the field, are transported directly to another location, probably on a branch-

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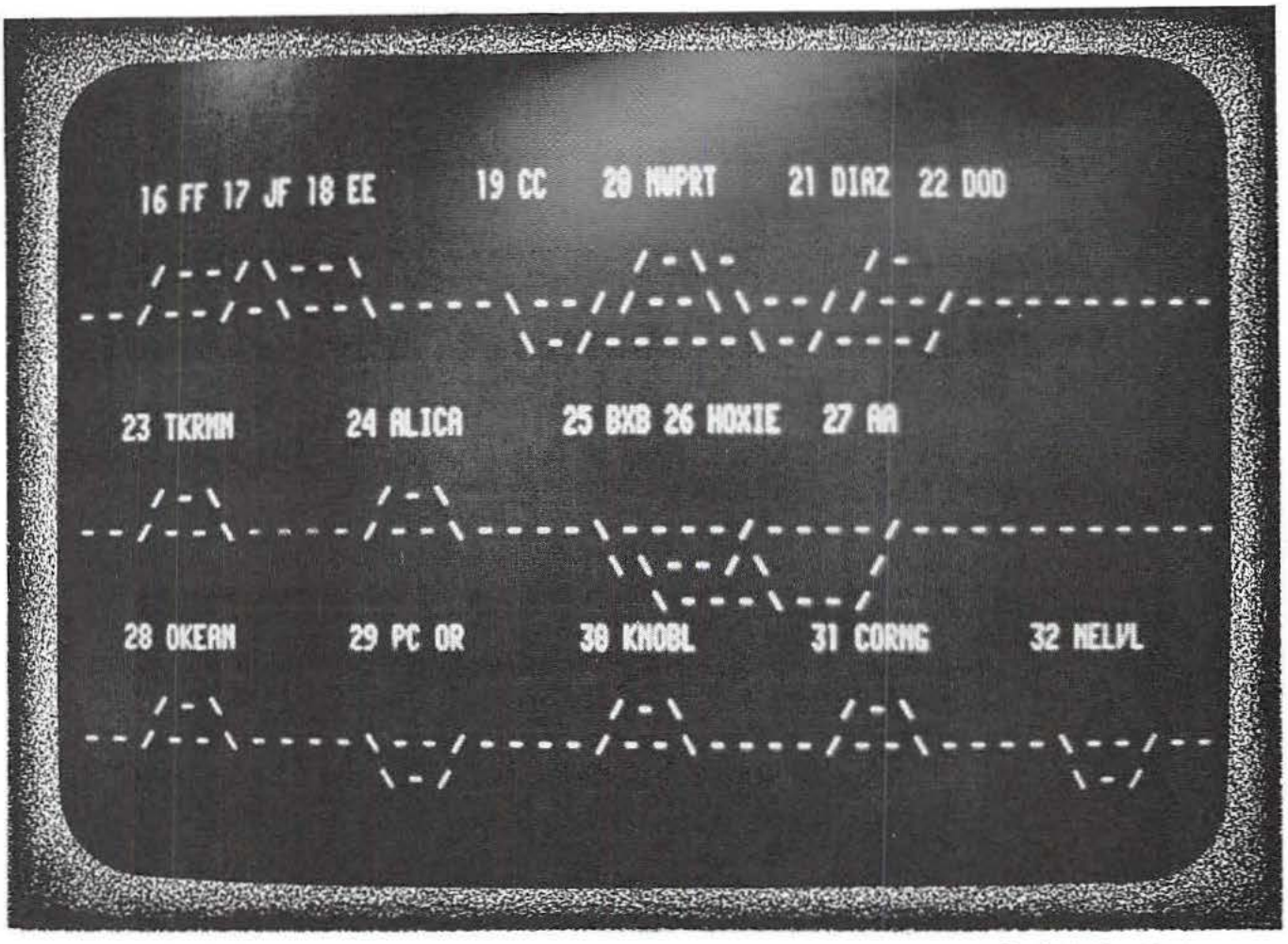

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EFFICIENCY IS THE WAY TO MEET FRA STANDARDS

line, for relaying. On both roads where these techniques are in use, they are considered to have important advantages.

● **In-track welding.** Another new technique that is considered to have possibilities for reducing the expensive joint effect is that of butt-welding joints in track on a production basis. The purpose is to avoid the expense of transporting secondhand rails to a central point for cropping and welding and then returning them to the field for relaying. Two methods are being offered for making the in-track welds. One uses the electric-flash method, the other the oxy-acetylene pressure method. At least one large road, Santa Fe, is now in process of evaluating these techniques.

● **Questions about mechanization.** Equally as dramatic as CWR as a method of reducing track-maintenance costs has been the mechanization of track work. At this point practically all roads are making extensive use of machines for performing nearly every type of maintenance work on the track. But two questions can be posed: (1) Are the roads making the most effective use of the machines they have; and (2) are they generally taking full advantage of the new and improved types of machines now being offered by the manufacturers?

As for the first question, an important consideration is that the most sophisticated machines, represented by the automated tamper-liners, give the best results of which they are capable only when their operation is closely supervised. The purpose is to assure that any malfunction will be quickly detected and corrected.

Equally important is the need to provide the services of sufficient field mechanics to assure that breakdowns will be quickly repaired. Also, the proper training of operators must not be neglected. The economies inherent in mechanization can be nullified either by machine breakdown or by failure of some key machine to keep the pace because of an inexperienced or inept operator.

Improvement in the technique of mechanization is a continuing process. To remain competitive the manufacturers must keep their R&D efforts going at a high level of activity. These must be directed not only at the betterment of existing machines but also at the development of entirely new machines. Result: The introduction to the market of new and improved machines is a frequent occurrence.

● **Is efficiency handicapped?** An important question is concerned with the extent to which railroad are able to make use of the new developments. To put the question another way: To what extent is the efficient operation of M/W work being handicapped by the continued use of obsolete machines or the non-availability, for financial reasons, of machines of new types? For example, the modern automated tamper-liners are probably the most productive M/W machines available, but it is a well-known fact that many machines of an older vintage are still in use. The same may be said of tie-renewal machines, spike drivers, anchor applicators and many others.

It is hardly to be expected that any railroad at all times will be able to afford an M/W machinery fleet made up entirely of the latest machines available. But it is evident that the further a railroad moves in the direction of this objective the more efficient will become its M/W operations. And greater efficiency will be the only way the railroads will be able to accomplish the increased amount of work required by the FRA track safety standards with a minimum outlay.

In any consideration of M/W technology this question projects itself into the picture: Has the mechanization of track work now become established on a plateau, with further progress to be confined to the modification or improvement of existing types of machines? For the answer, all that needs to be done is to reflect briefly on past experience. The lesson that this experience has taught the manufacturers is that, to remain competitive, they have to bring the qualities of boldness, imagination and creativeness to their R&D efforts. In that context who can tell what the future holds in the way of entirely new types of track-maintenance machines, possibly machines that operate by magnetic tape rather than by the hand of man?

> Improvements are on the way—but can railroads afford them?

Any discussion of modern technology would not be complete without reference to the track-analyzing cars now coming gradually into the picture. The latest such cars have onboard computers that are capable of instant printouts of priority defects in the track and of factors showing the relative condition of each mile of track. Railroads using such cars have found them of value not only for revealing defects that need immediate attention but also as a guide to the apportionment of maintenance funds.

Although such cars have been available for years, very few railroads are making use of this new form of technology today. But this situation could change as the need for precise track inspections becomes more pressing as a result of application of the FRA track safety standards.

● **Track research and the FRA.** While M/W men and the manufacturers are thus engaged in efforts to make the most of the present track structure, new infusions of technology are being channeled into the track field through various sources, notably the Federal Railroad Administration. To have the backing of the Federal government is a new experience for track men. A characteristic of that backing is that it is embracing the latest technological and scientific advances in research techniques and bringing them to bear on its research efforts in the track field. The most outstanding of these efforts to date is the Kansas Test Track, a project that the FRA is undertaking jointly with Santa Fe.

Engineers at the FRA emphasize that the Kansas Test Track is far more than merely a service test. It is a research project undertaken, they say, for the purpose of "quantifying the response" of various concepts. These include concrete ties, twin concrete beams under the rails and concrete slabs. A feature that sets this test track apart from others that the railroads have installed from time to time is the high degree of instrumentation that has been, or will be, incorporated in the ties, the rails and the embankment throughout the 8,000-foot length of the test track, which is located in a Santa Fe line carrying heavy freight traffic.

After this test track has been observed for several years the plan is to make a further installation, this one in curved track, which will incorporate the most promising of the concepts under observation in the Kansas Test Track.

FRA is known to be preparing other research projects involving track. Some of these will be carried out at the DOT research center at Pueblo, Colo., others are being farmed out to private research organization. But in all cases the approach will emphasize application of what is referred to as "the state of the art" in scientific research. With this type of technology working toward the betterment of railroad track, the prospects are that the future will bring some profound improvements. The problem will be to find the money to take advantage of them on the scale required to produce an appreciable impact on the total cost of track maintenance.

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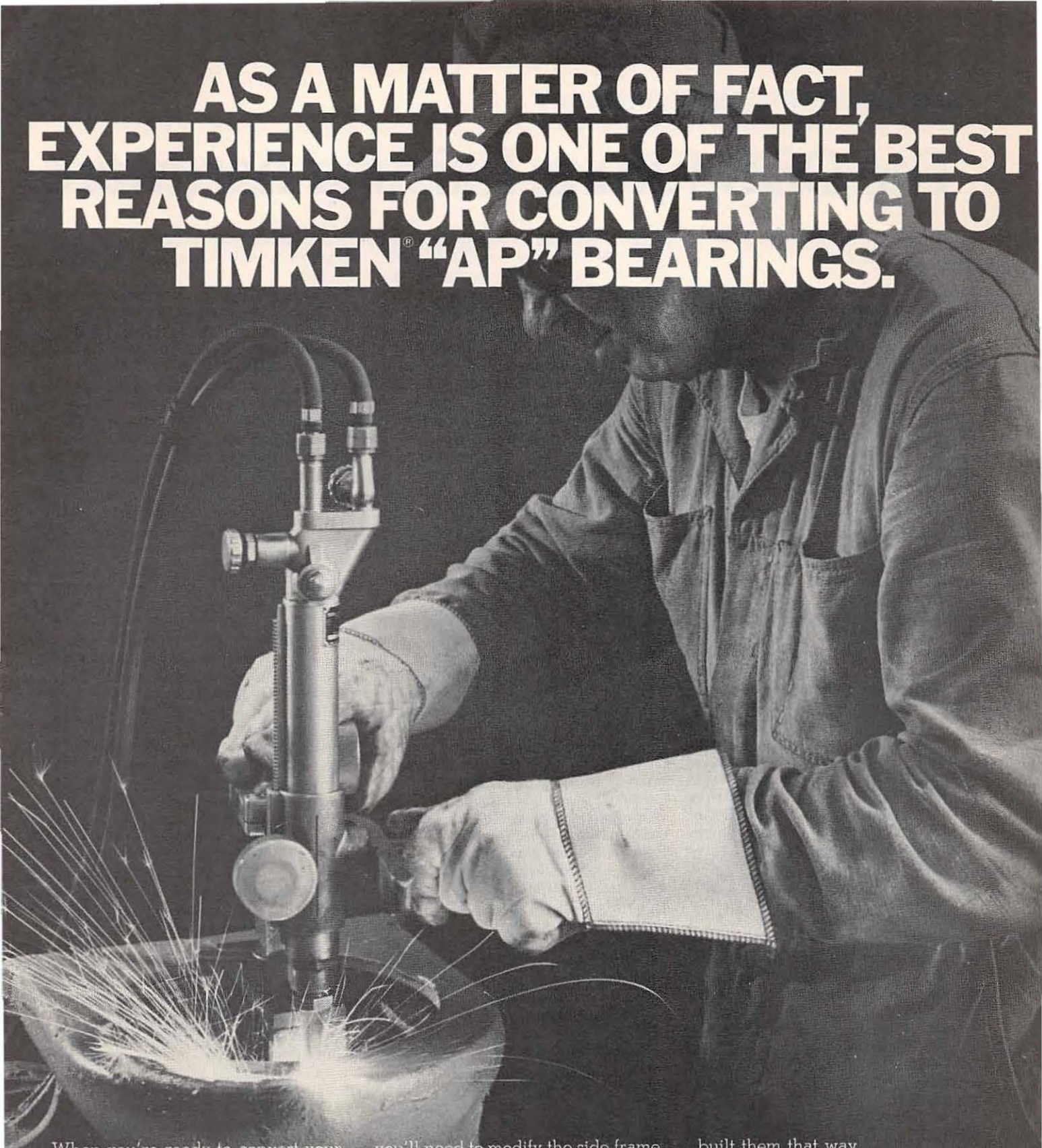

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The C&S future: Existing hardware,

By ROBERT W. McKNIGHT
System Controls Editor

The computer looms large in the technological-tomorrow of communications and signal departments.

That "tomorrow" will see the continued application of tried-and-true hardware in combination with advanced controls. And a key component of the advanced control technique is the computer. In classification yards, for example, the process control computer provides controls for automatic operation—car routing and speed control—and handles the management-information function of yard paperwork.

With advances in solid-state electronics—from the transistor to integrated circuits and beyond—have come minicomputers. These have found a myriad of uses in control applications, especially in signaling, communications, data processing and mechanical work.

Development of the minicomputer has enabled railroads to provide automatic controls for small-to-medium classification yards, which heretofore were considered too small to economically justify automation. Union Pacific, for example, automated a 16-track classification yard at East Los Angeles last year using General Railway Signal control equipment and a Nova 800 minicomputer. At Atlanta, Southern automated a 12-track TOFC yard using a PDP-11 computer and Union Switch & Signal controls.

Minicomputers have been used as data-concentrators by many roads as key components in automatic car identification systems. Detroit, Toledo & Ironton applied this technique at its Flat Rock Yard installation using a Sylvania computer and KarTrak aci scanners. Under Servo ownership, KarTrak equipment working into a minicomputer is being installed by the Elgin, Joliet & Eastern at Joliet, Ill.

For ACI Systems Corp., the minicomputer is the heart of its aci equipment, often multiplexing three or more scanners on one minicomputer. Peoria & Pekin Union has nine scanners working into three PDP-8 minicomputers providing complete yard control at East Peoria, Ill.

● **Ecological impact too.** Railroads are becoming cognizant of the importance of environmental control, and in retarder classification yards noise is an important factor. In building its Northtown Yard near Minneapolis, Burlington Northern has constructed an earth-dike which is adjacent to a residential area. The dike will act as a sound absorber, and will tend to drive sound up and away from the residential area.

Several years ago, Burlington took the squeal out of its inert retarders at Cicero, Ill., yard by installing ductile iron and graphite inserts in the ball of the retarding rail. Not only did these inserts reduce the sound level; they also provided a better retarding effort than the previously used all-steel rail.

At Macon, Ga., Southern reduced noise in the yard by providing two-way portable radios for all personnel working in the yard, thus eliminating the need for talk-back and paging speaker systems. A similar policy will be used at the new Sheffield, Ala., yard.

Norfolk & Western has found that environmental impact can be the impetus for a money-saving method of solving a problem. At its rebuilt Roanoke, Va., yard, several thousands of dollars worth of installation costs were saved by the use of a recirculating heat exchanger-type cooling water system for the retarder compressed-air equipment. The recirculating system obviates the need for city water and made it unnecessary to install a water line under several yard tracks.

● **Computers and aci.** The computer-aci configuration comes in about as many combinations as there are users. Southern Pacific, for example, treats its aci scanners as communications terminals to be polled by its TOPS computer in San Francisco. At new Colton, Calif., yard, now under construction, a variation is planned with the aci scanners bracketing the yard probably to be polled by the process-control computers for the yard. Thus aci consist data will be immediately available for planning car classifications.

At Argentine Yard on Santa Fe, the 10 aci scanners bracketing the yard feed directly into an IBM 360/30 computer in the yard office that handles all the paperwork. This computer also matches the aci input data with the advanced consist received from the road's teleprocessing center at Topeka.

One of the nation's biggest aci projects is about to get under way in Chicago. The Chicago Railroad Terminal Information Systems, Inc., a non-profit organization, was formed by the General Managers' Association of Chicago to implement a railroad terminal information system. The system will collect train and car movement data on 17 million freight cars moving on a half-million trains that annually originate, terminate or move through the Chicago terminal.

CRTIS will locate 109 aci scanners at 40 sites adjacent to tracks connecting over 100 freight yards served by 30 railroads in the Chicago terminal. Data from the scanners will be fed into a central computer for processing and merged with detail information on the cars furnished by the railroads and input to the same central computer. As a result of the data collection from the railroads and the aci scanners, output information of advance consists, OS train-location reports, interchange, empty car and system equipment analysis reports will be provided to each railroad in its own format.

● **Computers work on CTC.** Computer technology has also advanced to the point where computer control of centralized traffic control systems is practical and economical. For example, GRS' Traffic Master II combines the principles of pushbutton control with the high-speed and volume processing of a minicomputer. Chicago & Western Indiana has ordered a system for installation in the Chicago area.

In another area of ctc control by a computer, Quebec North Shore & Labrador has connected an IBM System 7 to a CTC machine to monitor all train movements to predict meets and arrivals, and to provide the inputs to a new data base on train operations.

● **Savings via centralization.** Centralized dispatching can bring about savings through reduction in manpower and importantly bring about better control at operational headquarters. Frisco, Illinois Central Gulf and Western Pacific have centralized their dispatching operations. Denver & Rio Grande Western is in the process as one result of its plans to move its general offices into a new headquarters building in Denver.

(Centralized dispatching also has been successfully applied by rapid transit authorities in Toronto and New York and on Port Authority Transit in Philadelphia. Long Island has centralized its power dispatching; all third-rail power distribution and sub-station controls are handled from a central power board at Jamaica.)

● **Communications is vital.** Like the nerves in the human body, communications links penetrate everywhere in a railroad or rapid-transit system to keep them operational.

For railroads, as with other industries, communications usage is growing

new controls

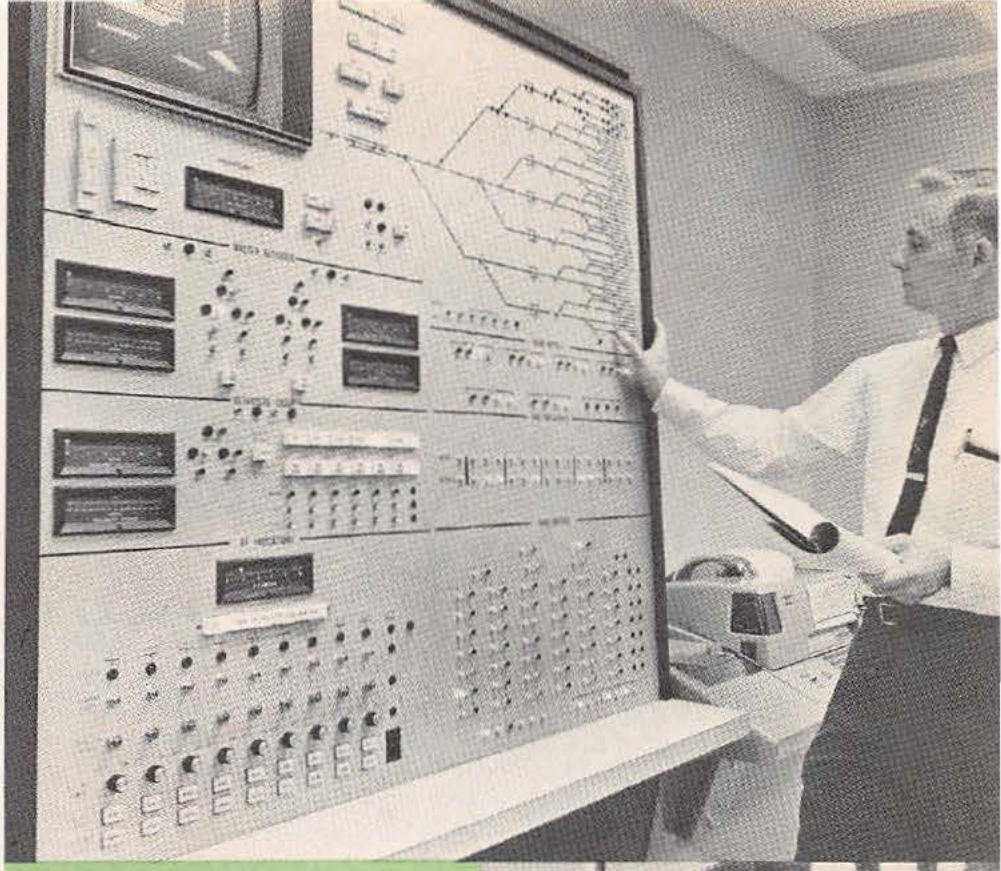
at a healthy rate. For example, data-transmission volumes are rising 45% annually, voice traffic is increasing at least 25% yearly, and administrative or message traffic is growing at the rate of 10% annually. To meet the rising demands for communications, railroads are resuming the installation of microwave systems, following the lull when American Telephone & Telegraph Co.'s Telpak bulk communications tariffs were operative. These have been ruled discriminatory by the Federal Communications Commission, and AT&T is in the process of providing services to take the place of Telpak. Rumors are that a new bulk service is about to be offered by AT&T and the telephone companies to make them competitive with private microwave systems.

"With today's leased communications costs, a microwave system will probably pay for itself in about two years, or even less if you have heavy traffic requirements," says one road's communications engineer about his experience with microwave. BN, to meet the expanded communications needs of its merged components, has contracted with Collins Radio to install microwave from Chicago to the Twin Cities and on to Seattle, the latter portion to be along the former Great Northern mainline.

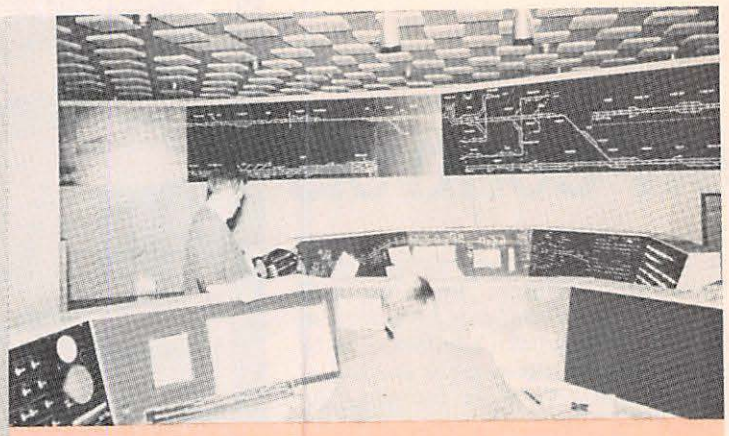
Newcomers to the railroad microwave scene (those roads making studies or looking into the possibility of making microwave a key artery in their communications) include Chesapeake & Ohio, Frisco and Norfolk & Western.

Railroads can also take advantage of recent FCC decisions that open up greater interconnection possibilities between railroad communications systems and the public telephone network. For several years, railroads have had limited interconnection rights in the public interest because of the safety requirements of their operations. Many roads can save on communications equipment costs by buying automatic telephone exchanges (PABX's) and locating them at key points, for interconnection with the public telephone system. There are still some technical requirements to be met concerning line supervision and protection for the public telephone network, but details can be worked out with the particular telephone company involved.

● **Facsimile usage grows.** Railroads are finding facsimile transmission useful in transmitting work orders, switch lists and messages between various intra-terminal offices, between offices in dif-



PROCESS CONTROL COMPUTER can handle the operating functions of an automatic classification yard, such as car routing and speed control. It can also handle information processing, such as receiving on-line, in real-time inputs from aci scanners. In addition, the computer will handle the paperwork, update class yard inventory, prepare switch lists, hump lists, train consists.



MICROWAVE providing bulk communications for a rail system makes possible centralized dispatching, whereby ctc control machines for an entire railroad can be located at operational headquarters. Manpower reductions are often accomplished and more efficient utilization of motive power is obtained when control is vested for the railway at headquarters.

ferent locations, and for exchange of information between railroads. For the latter, Santa Fe uses facsimile at Kansas City and Dallas to send reports to other railroads concerning cars interchanged. At Seattle, Union Pacific uses facsimile for interchange of documents with other railroads. In the Chicago area, Milwaukee and N&W exchange lists of cars interchanged between yards, using facsimile transmission.

A recent FCC ruling should be an impetus for further growth of railroad usage of facsimile, that of providing a written message in locomotives, cabooses or automobiles, Thus it would be possible to provide a train crew with a written train order from a dispatcher, the facsimile transmission taking place via vhf radio.

● **Back to computers.** So, the computer is a control tool, with its inter-relationship to signaling and communications. But there are many things that railroads are doing to make computers more efficient—and they really must, because there are about 250 of them in service on American railroads, according to a recent AAR survey. In general there is a trend to make paperwork production more efficient, and many roads are now engaged in extensive projects of refining or improving programs to make computers operate more efficiently.

● **Simulation payoff is big.** Computer simulation of railroad operations is another area where technology can probably save railroads considerable money in not having to make costly mistakes to find out how not to operate. Several railroads, such as Canadian National, CP and Santa Fe, for example, have used computer simulation of train-running to determine proper siding locations in CTC territory or proper spacing of signals.

Mechanizing the paperwork to make it more efficient and accurate can bring handsome monetary savings. The following two examples are cited to show what can be accomplished. Penn Central reports that one of its accomplishments in 1971 was a computer audit of freight revenue settlements. One-time benefit from interest avoidance amounted to $572,000. Annual savings come to $132,000. By consolidating all demurrage activity at Philadelphia, including data processing, billing and collection, annual savings amount to $118,000.

In another area of computer efficiency, roads are changing from disc or tape operating systems to full operating systems, often releasing one or more computers. PC was able to do this and release a model 360/40 and provide annual savings of $170,000.

● **Intelligent terminals.** Several roads (IC and Southern, to name two) are installing "intelligent" terminals to be linked via communications systems to their central computer. The reason is to cut down on transmission of errors, refine and edit data before transmission, and in general make the teleprocessing system more efficient.

Optical character-recognition devices are coming into railroad usage to provide direct input into the computer process without human intervention. SCL, for example, is installing OCR devices this year for handling interline and local forwarded waybills, payroll documents and vouchers payable.

● **Money is vital.** More than ever, the priorities for allocating money for the technology of survival will have to be carefully weighed. However, the technology of the computer-application art is such that management decisions can now probably be made with more meaningful background information than ever before.

It will still take intelligent, common-sense managers but at least they have or should have technology helping them—not mastering them.

There will be a requirement for a force of skilled personnel to service and maintain these devices of technology. There will be several levels of skill requirements, ranging from a helper to a highly skilled electronic technician.

In some areas, such as solid-state carrier or multiplex systems or minicomputers, plug-in unit replacements can now be made. But unfortunately, the practice is not universal, and the need for skillful trouble-shooters is still required, especially for signal systems.

● **Training essential.** Although many technicians are being recruited for railroad service and many of these men have a technical school or two-year college background, there will continue to be a great need for training on the part of the railroads to bring these men in line with the required skills.

One signal supervisor views training as follows: "If you have trained maintainers, they do the trouble-shooting and maintenance. This not only makes my job easier, but I have time for the important job I must do—supervise, plan work and programs. It's expensive for the railroad, if I have to shoot trouble or stand over a man and tell him how to repair or service a piece of signal equipment." ■

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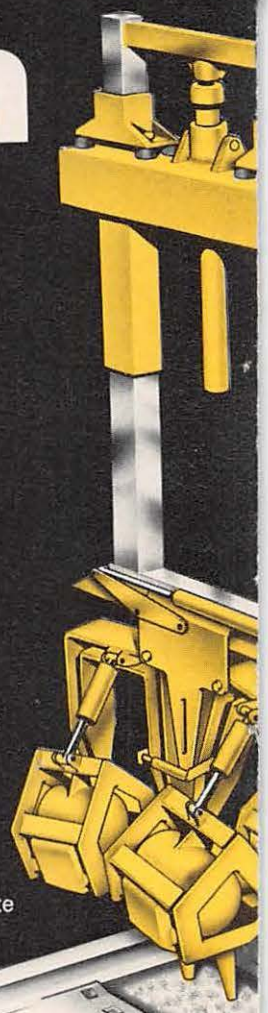

It's true! The Jackson TampTrak is a complete track maintenance unit—it raises, crosslevels, lines and tamps—all in one operation. TampTrak does the **complete** job — handles switches, insulated joints, crossovers, and close-clearance and guard-railed sections. TampTrak puts up track that is unexcelled in quality, track that retains its quality far longer.

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Compatible with Jackson Light-Sensing Units, either attached or independently radio-controlled, for precision surfacing, crossleveling, and lining within 1/32" tolerances. With Jackson solid-state modular constructed electro-optical systems, the operation can be entirely automatic.

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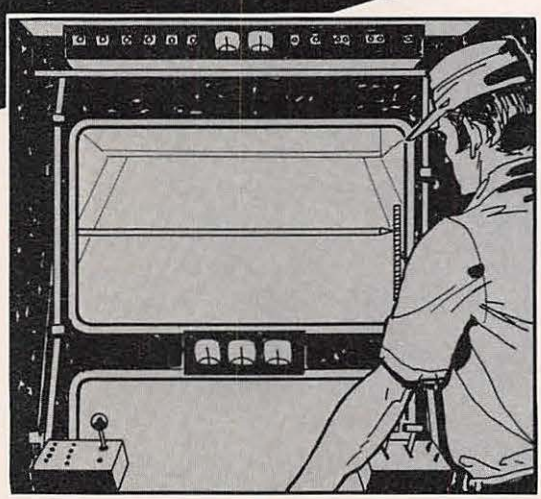
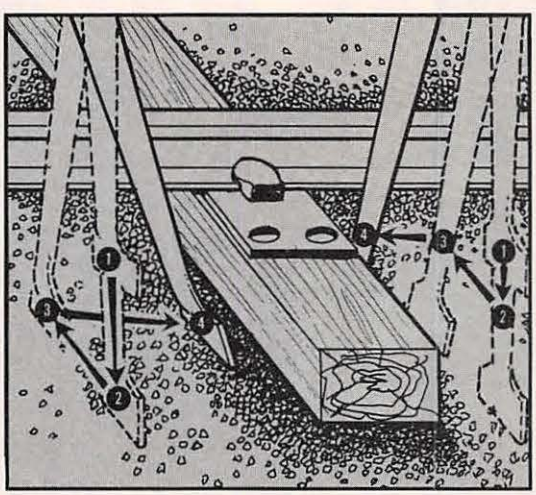
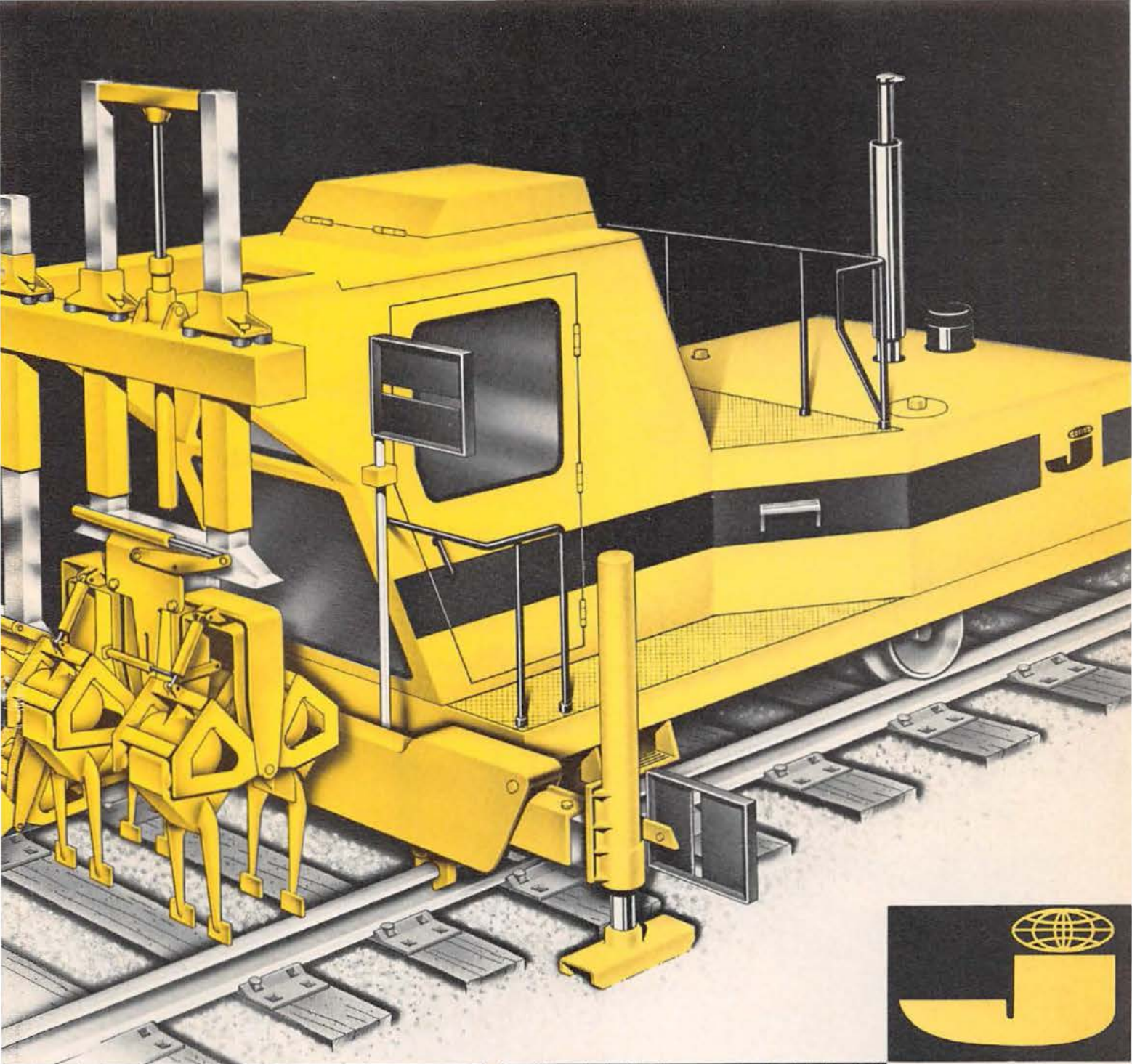


Cab is fully enclosed for safety and to comply with Federal Noise Standards. Vibration is completely isolated from cab. Modular actuated controls for jacking, crossleveling, lining and tamping are directly in front of operator.



Picture shows 2 of 16 tamping tools and illustrates Jackson's patented "Tilt-Squeeze" operation. Each of the 16 tools exerts a 4-ton blow, 4,500 times per minute, to produce a completely homogeneous, rigid sub-structure under the greatest load-bearing area—the intersection of the rail and tie.

Hydraulics are all located within the work height cupola atop the cab. By simply the hinged cupola top, inspection or servi fast and easy.



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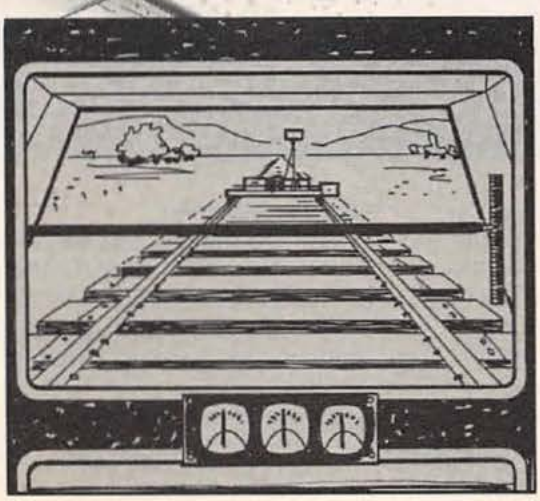
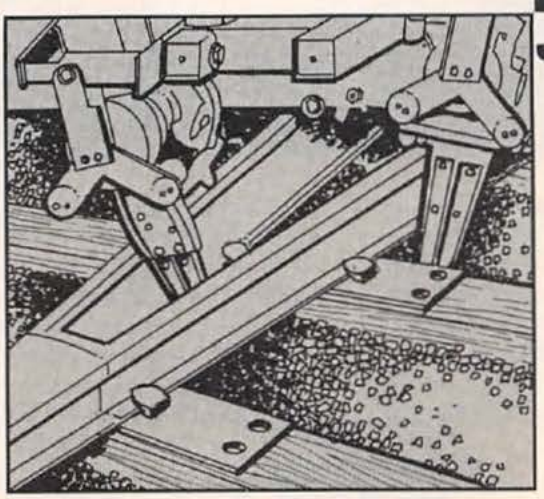


Jackson's new lining system attachment provides unexcelled accuracy in lining both tangent and curved track. Note: lining attachment can also be used with Jackson's Model 2300 Tamper. Jackson light-sensing units are accurate to 1/32" surfacing and crossleveling.



Switch tamping—the Model 2600 works 100% of a switch, plus crossovers, insulated joints and close-tolerance and guard-railed sections.

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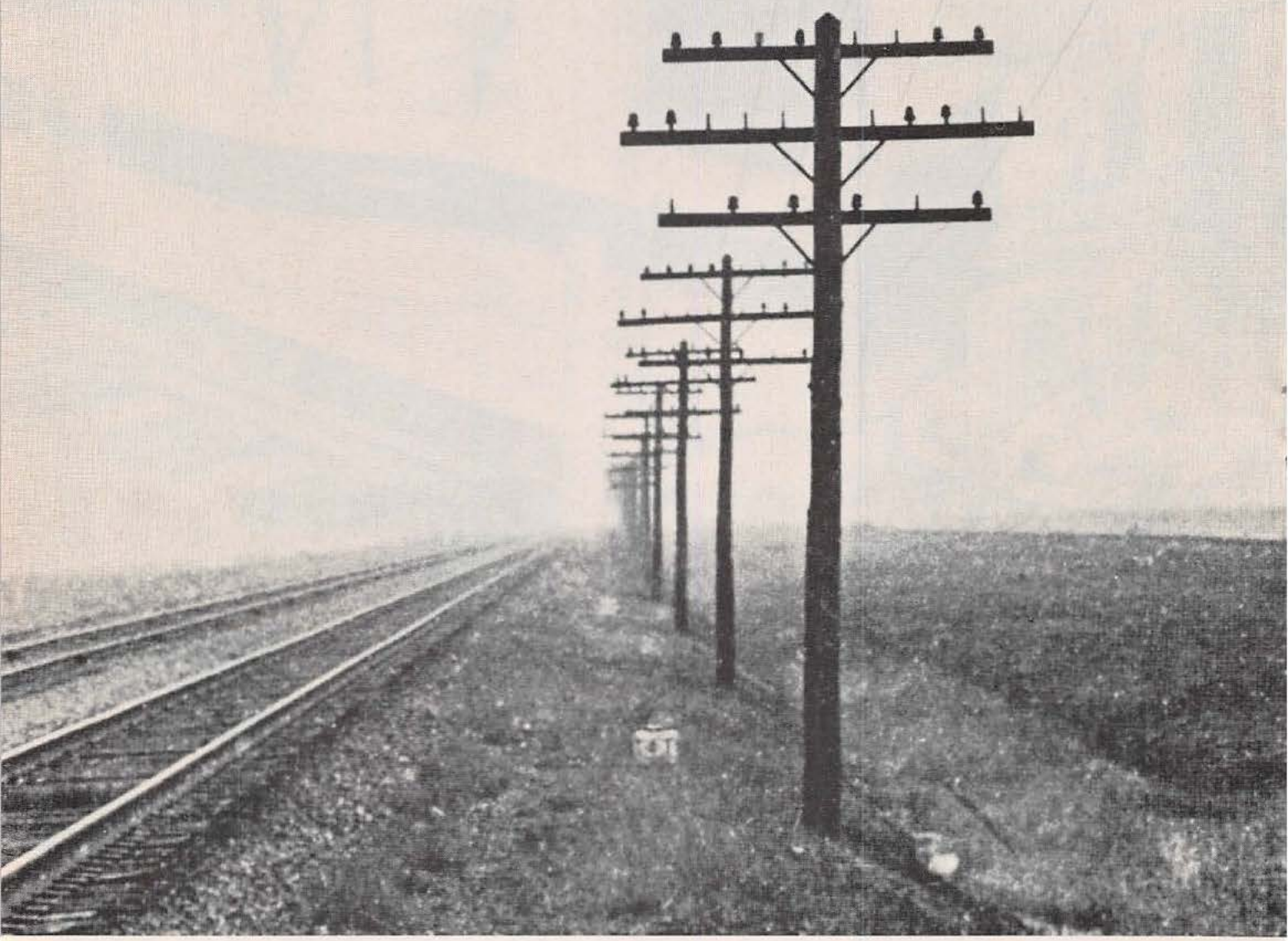

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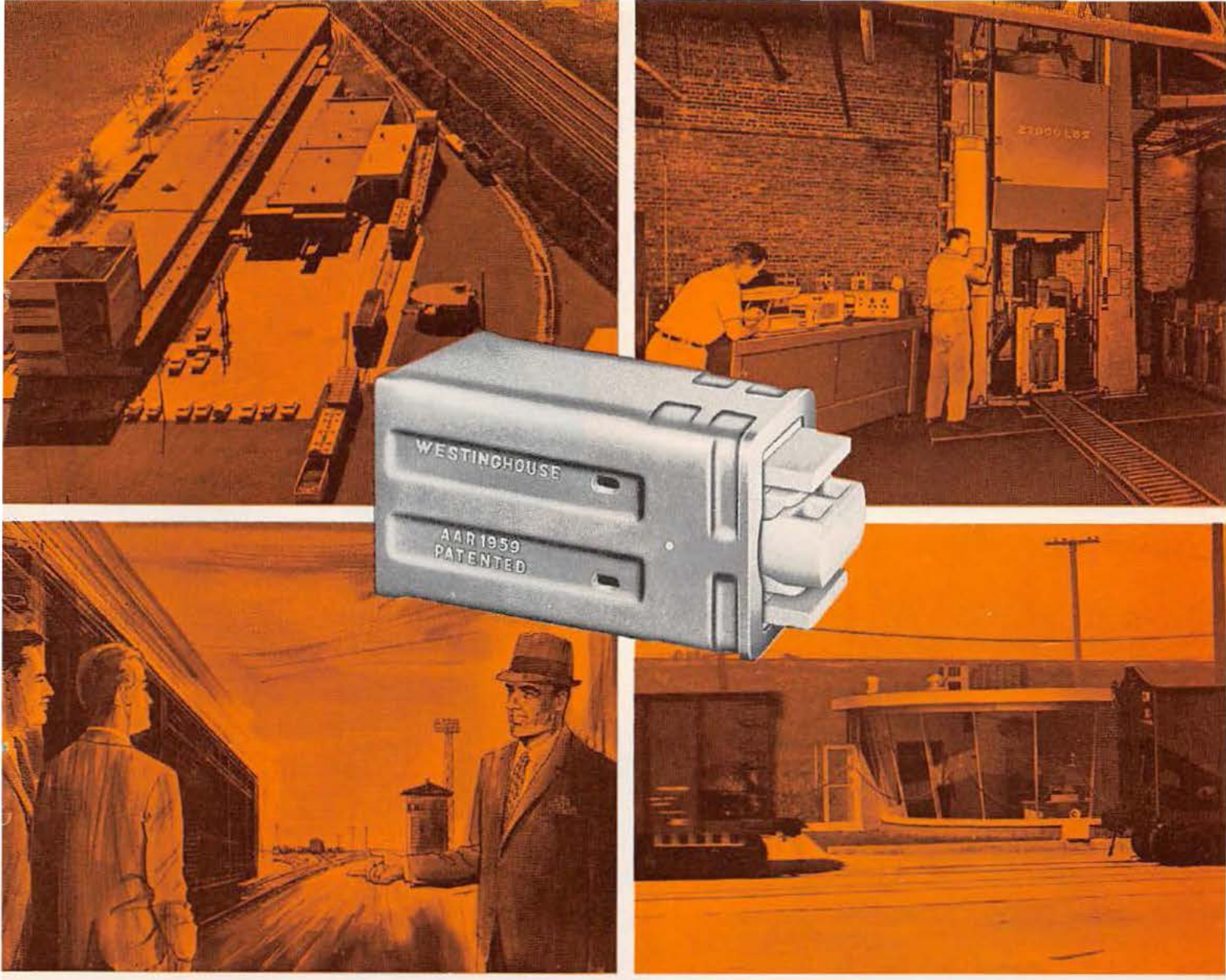

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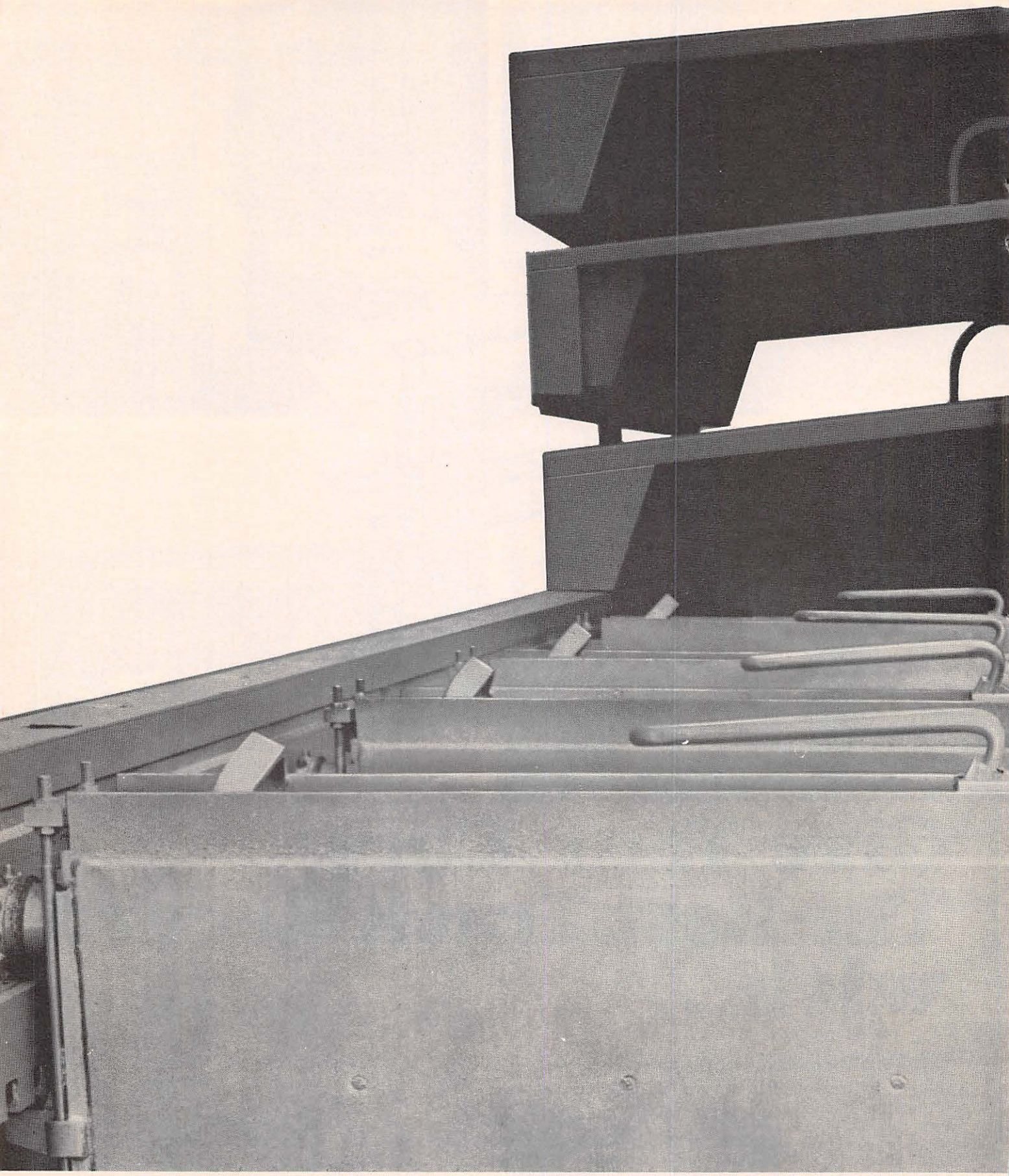

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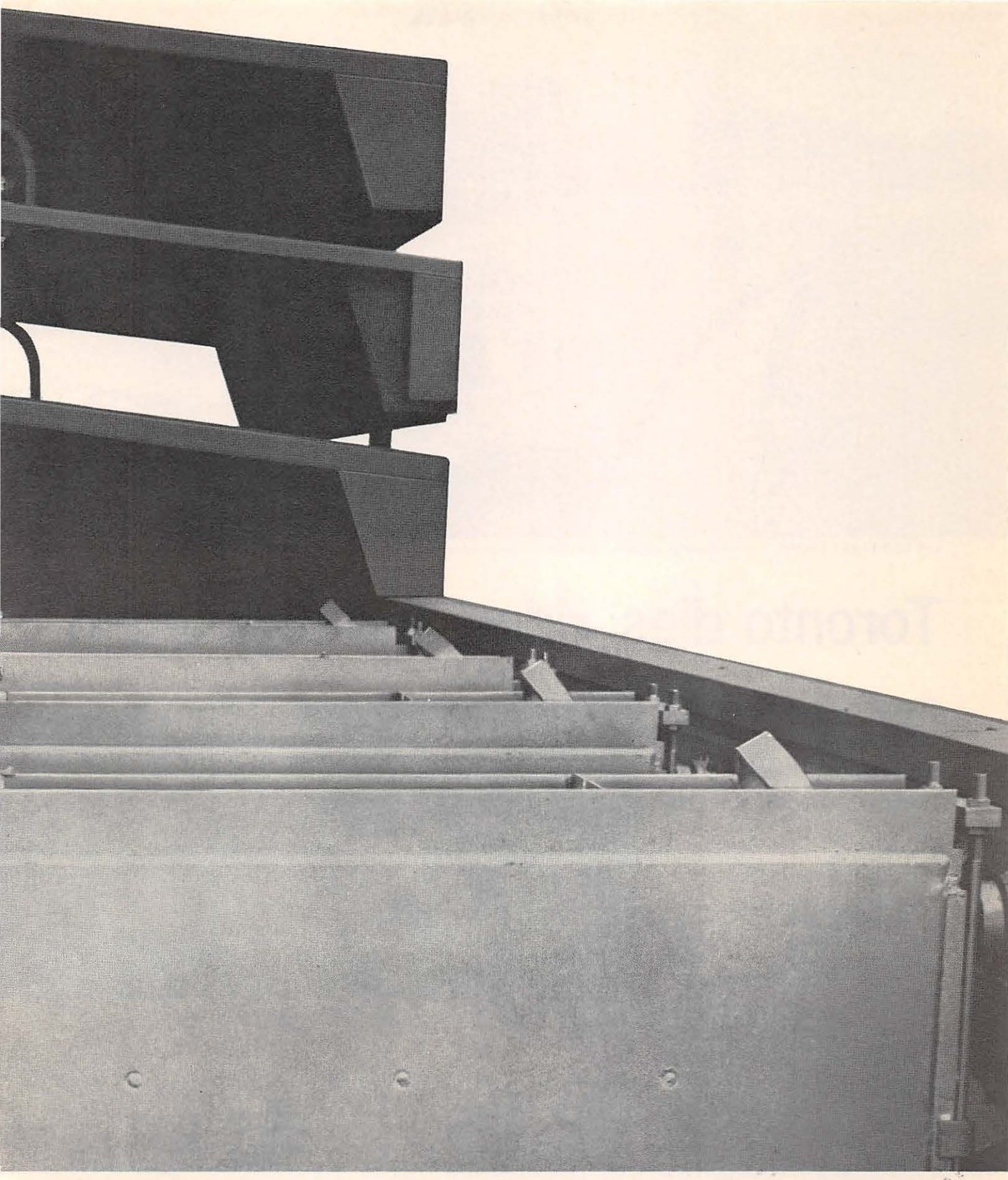

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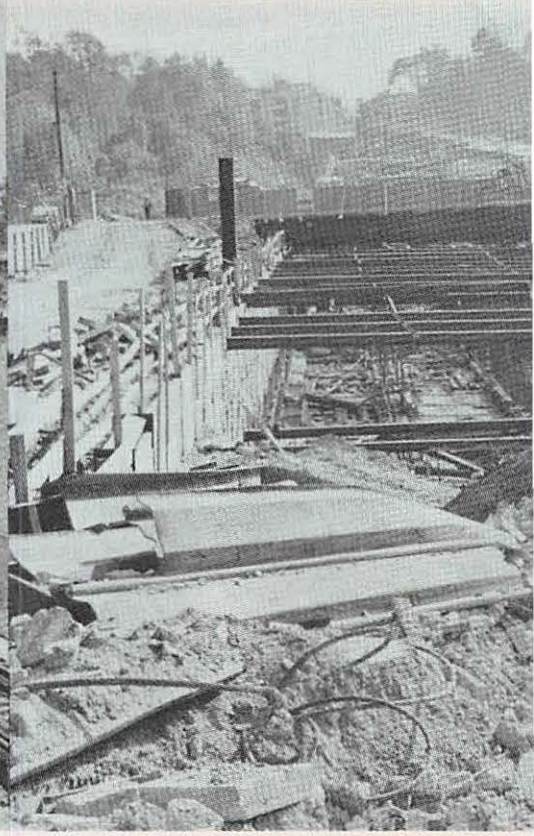
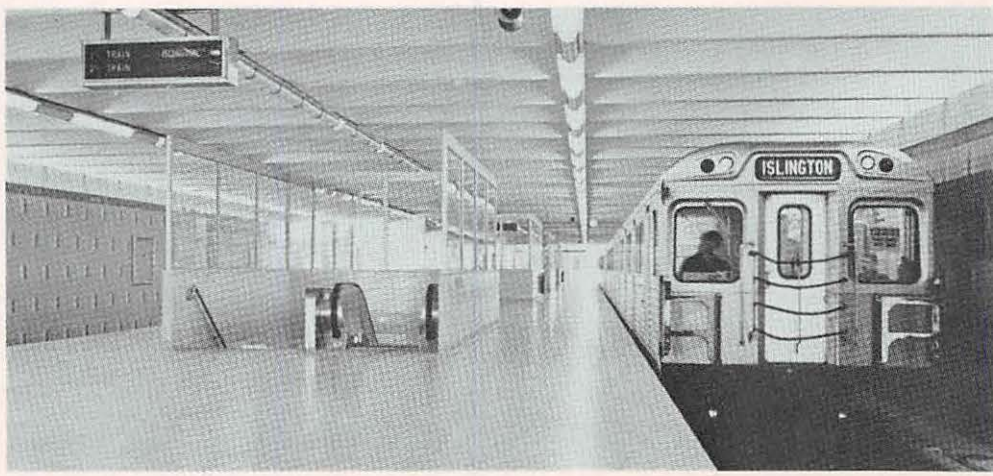


THE LINES EXPAND: Cut-and-cover goes forward

Toronto digs, rides, and digs again

The approach is no-nonsense and methodical—the results are dazzling. That's why the eyes of the transit world are on Toronto.

By JOE ASHER, Transit Editor



LIVELIER GRAPHICS, better sound levels distinguish the newer TTC stations.

Transit people tend to call Toronto an outstanding showcase for transit. That it is. But the explanation doesn't depend on Giants Walking the Earth in Ontario. Nor does it depend on exotic technology.

Instead, it's very simple. The Toronto Transit Commission is into common sense. Everything *works.* TTC doesn't scrap concepts or hardware just because they've become unfashionable elsewhere; nor does it jump on the bandwagon when something else becomes the industry's latest panacea. The TTC approach is functional, result-oriented, and devoid of the progress-through-repackaging associated with some transit endeavors elsewhere.

● **One step at a time.** The current big activity is extending the rapid transit part of the TTC. Instead of opting for the "everything-at-once" approach, TTC has built its new lines and added its new car fleets piecemeal. The result is that the 4.6-mile rapid transit system that first opened for business in 1954 has come up by stages to 20.7 miles, and will reach 26.2 miles in the next two years.

Characteristically, the current work was split into two segments. The first is a four-mile extension (north from Eglinton to Sheppard Ave.) of the north-south Yonge St. line. Another 1.5-mile segment will continue the line still further north to Finch Ave.

Labor trouble in the construction trades slowed down work somewhat. So the first segment will open only as far as York Mills next March; the remainder plus the second segment in the fall of 1974. Total cost of the two segments, including vehicles to run on them, is $140 million.

According to W.H. Paterson, TTC general manager for subway construction, the work has been fairly straightforward, with no unusual engineering problems. But instead of welding rails in place, long-welded rails are being laid.

● **Underground level for buses.** What unusual features there are may be found at two of the four new stations. The one at Lawrence Ave. will have two underground levels—one of them to accom-

on 5.5-mile extension.

ACCESS IS GREAT: Look at all that park 'n ride, bus 'n ride and new housing.

SPECIAL ACOUSTICAL BAFFLES go in at Sheppard Ave. station, to open in 1973.

modate feeder buses coming off the street on ramps.

Paterson acknowledges this drives up construction costs. But the point is to avoid bottlenecks at a busy street intersection. In addition, there are savings on land acquisition costs. Says Paterson: "There's a developer who thought he was going to get a lot of money for that land. Was he surprised."

The eventual northern terminus at Finch Ave. will have another special feature—kiss 'n ride facilities that function like a carousel. Motorists discharging or picking up riders will circle an enclosed waiting area that connects by tunnel with the transit station.

● **Feeding the trains.** These are good examples of how TTC uses bus 'n ride, kiss 'n ride and park 'n ride to feed the rapid transit system. Some 80% of the rapid transit riders come off TTC surface vehicles, and interfaces are so arranged that 85 of TTC's 102 bus routes make 108 connections with the rapid transit lines.

That degree of integration is remarkable, and the results show up dramatically in ridership. In the face of widespread declines elsewhere, TTC showed a 23% increase in all revenue passengers (subway and surface vehicles) over the decade from 1962 to 1971. In the same period, rapid transit ridership (revenue and transfer riders) more than doubled—from below 70 million to above 162 million. Daily weekday ridership on the subway routes is well over half a million.

● **410-car fleet.** To service the North Yonge extensions, TTC took delivery of 76 new cars from Hawker-Siddeley which brings the size of the rail car fleet to 410. The new cars are of the same general type as previous aluminum cars Hawker-Siddeley supplied TTC. They're going through their acceptances in orderly fashion, according to James H. Kearns, TTC general manager of operations, who adds, "We may be going out for some more cars."

By concentrating on modern shop and yard facilities and maintenance, TTC has kept up an outstanding record of trouble-free operations. Year in and year out, TTC wins the American Transit Association's safety award.

But TTC has had its share of car bugs, like everybody else. John Inglis, Kearns' predecessor, used to complain of wheel shelling. Kearns says the problem was brought under control by making adjustments in the braking and suspension systems.

For his part, Kearns notes problems with motors on the last batch of cars before the present ones, saying that in

With two general managers, can the left hand know what the right hand is doing? In fact, it works.

W.H. Paterson
General Manager, Subway Construction

James H. Kearns
General Manager, Operations

the end, many of the motors had to be completely rewound. (Those motors were by Canadian Westinghouse; the latest cars have motors by Brush Electric.)

● **New lines on the drawing board.** To say that TTC adds new lines and car fleets piecemeal is not to say that TTC has no overall design for where it is going. Traffic and land-use studies over decades established the broad parameters of where rapid transit has potential. TTC has three proposed new lines on the drawing board.

One of the more important planning pluses for transit is that Toronto was the first city on the North American continent (and still one of the rare ones) to adopt a metropolitan form of government. The city of Toronto and 12 suburban municipalities (later converted to five boroughs) set up a Metro Council with responsibility for water, sewage, transportation and other regional planning activities.

The Council, which has two members on the TTC board, has real power, not just advisory functions. So the result is an end-run around the usual city-suburb squabbling over jurisdictions, route alignments and cost-sharing formulas.

It isn't a panacea, says Kearns. There can still be planning delays and undue political pressures. Even so, at a minimum, there is a big drop in the volume of jurisdictional jockeying.

The first of TTC's three proposed new lines would be in or along the Spadina Expressway route, leading north and northwest from the city center. This would give TTC its second north-south line.

The second would be an east-west line along Queen St. which would bisect downtown and veer north at its eastern end to link up with TTC's existing east-west line, the Bloor-Danforth line.

The third would also be an east-west line, running parallel with Bloor-Danforth, but further north, along Eglinton Ave.

● **Caught in a crossfire.** It can't be said that the Metro mechanism solved planning squabbles in the early-priority project, the Spadina route. TTC intended to build in the median strip of the partly completed new road. But then a pitched battle developed between highway groups and environmentalists. The latter won a big victory a year ago when they got construction of the road halted. But this left TTC's plans in limbo, and a decision on what to do next is still to come. It's possible that work on the lower portion of that line can go forward, but for now, all TTC has is some early design work.

As for the other two lines to come, Kearns says they are "years away."

One other TTC project ties in with the $1 billion-plus program for a complete redevelopment of the main-line Canadian National and Canadian Pacific property at the foot of Yonge St., adjoining Union Station. Metro Centre, as it's called, will be a kind of counterpart to New York's World Trade Center, but spread out over far more territory, and having many kinds of business development. TTC will expand its own facilities there with extra tracks and platforms. It's also possible TTC will build a people-mover system to connect this area with the nearby Canadian National exhibition grounds.

● **The lessons of Toronto.** Whatever happens next on these plans, Toronto continues to point some morals to the industry and to urbanists at large.

First and foremost is that transit is a tool for land use that confers important economic benefits on the areas it serves. The $10 billion real estate boom in Toronto has been commented on many times; it's worth repeating that higher tax assessments more than paid the cost of constructing the transit lines. The lines are steadily expanding and so are the benefits, as a look at any outlying real estate development close to a transit station testifies.

Second, the concept of close integration of surface and sub-surface lines *works*. It gives the lie to all the planners who see little or no evidence of rising demand for public transportation.

Third, Toronto proves that there is more to improving mobility than just phasing in whatever is the latest hue and cry in technology. For example, TTC elected to keep PCC cars and trolley-buses when other cities were scrapping them wholesale. The Toronto attitude was: If they work, why get rid of them?

And on the rapid transit side, TTC picks and chooses among innovations. There has been no hurry to introduce automatic train control, air-conditioning, and certain other developments that are sweeping over the industry.

Says Kearns: "The key issues are reliability, frequency and speed. We could only justify air-conditioning maybe 10 or 12 days a year, and it's expensive not only in first cost but in maintenance."

TTC *has* chosen to innovate on its own terms. The long (70 to 75 ft), light car (aluminum or stainless steel) has come to be favored by the industry on grounds of power savings, operating flexibility and improved maintenance. It was pioneered by Hawker-Siddeley's aluminum 75-footers built for TTC.

Important work has also been done by TTC on acoustical insulation in stations, and on vibration reduction at the interface between rail and roadbed. TTC also has trials going on now with chopper controls supplied by a Japanese builder for six Toronto cars.

Kearns says he is interested in such new concepts as linear induction motors and magnetic levitation, but adds: "The steel wheel on steel rail concept is 100 years old, and still not perfect. You can be sure these new technologies are going to need a lot more testing. In the meantime, our needs are today and tomorrow."

It's just that—worrying about "today and tomorrow"—that earns Toronto its showcase reputation. ■

Moving People

PULLMAN WINS 752-CAR NYCTA CONTRACT

The largest single passenger-car contract in history went on the books Sept. 5: 752 air-conditioned cars to be built by Pullman-Standard for the New York City Transit Authority. Signing of the $210.5-million contract was announced by New York Mayor John V. Lindsay and Metropolitan Transportation Authority Chairman William J. Ronan. Elwyn Ahnquist, president of Pullman-Standard, was on hand. Delivery of the first of the new cars—designated R-46—will come in late 1973. The cars will be similar to the R-44's, built by St. Louis Car, now being placed in operation on the NYCTA. Said Ronan: "While the R-44 is now among the quietest transit cars in the nation, the R-46—with specified modifications to the air-conditioners, compressors and trucks—will provide an even quieter performance whether they are idling in a station or in high speed." Mayor Lindsay commented that "when delivery is completed all cars in the system will be post-World War II in age. At that time the newer, air-conditioned cars will represent approximately 20% of the entire subway fleet of nearly 7,000 cars." Ahnquist said the cars will be built at the Pullman Car Works on Chicago's south side and "will mean the addition of approximately 1,000 workers in the next two years to our present work force of 450 people." The purchase contract is unusual in that it calls for two-phase delivery. The first-phase order is for 454 cars with 298 to follow as full Federal financing becomes available.

AUTO-TRAIN: THE RED AND THE BLACK

For first-half 1972, Auto-Train Corp.'s operating revenues ($5,670,270) exceeded its operating expenses ($5,457,064) by $213,206. But after deductions for taxes, interest, equipment rentals and "other expenses" (primarily an extraordinary start-up charge of $1,105,748), Auto-Train showed a loss of $736,030 for first-half 1972. The company's first annual report, due this month, will show a loss for the fiscal year ended April 30 of $2.5 million, again reflecting write-off of start-up costs. But Auto-Train President Eugene K. Garfield says Auto-Train has been operating in the black since last March, and he expects stockholder reports to show a continuing profit margin. Underscoring its faith in the profitable future of its Washington-Florida runs, Auto-Train in August added four bi-level, half-dome passenger cars to its fleet. Garfield said addition of the four coach lounge cars "will give us the flexibility to better meet peak demands for space—particularly during the summer and holiday seasons when larger family groups book on our unique Auto-Train service."

CTS FINDS IT PAYS TO ADVERTISE

Cleveland Transit System's multi-media advertising campaign, now in its fifth month, has returned 164% of its cost ($9,400 a week) in added revenue, CTS Marketing Manager Thompson A. Nooner told the Ohio Public Transit Association. Nooner said it's necessary to "hard sell" transit because "whole generations of motorists have grown up without knowing there was a transit alternative. Therefore, the consumer has to learn as if transit were just invented."

READING, SEPTA AGREE ON TAKEOVER

The bankrupt Reading Co. and the Southeastern Pennsylvania Transportation Authority have reached an agreement in principle calling for takeover of Reading commuter service by SEPTA. Negotiations for the takeover began late in 1971 after Reading President Charles E. Bertrand said the railroad would seek discontinuance of the service unless it was compensated in full for losses, or the service was taken over by a public agency. Bertrand said he anticipates final details of the takeover agreement will be worked out within the year. He added: "In the meantime, we have a contract with SEPTA that reimburses us for the cost to provide the service not covered by revenues of up to $540,000 a month."

SOAC CARS ARRIVE AT PUEBLO

Two prototype State of the Art Cars (SOAC) arrived at the Department of Transportation's high-speed ground test center at Pueblo, Colo., Sept. 3. They were shipped from the St. Louis Car plant Aug. 31 via Norfolk & Western and Santa Fe. The cars will undergo a comprehensive test program, under the direction of Boeing's Vertol Division, at the Urban Mass Transportation Administration's transit test track at Pueblo. DOT Secretary John A. Volpe and UMTA Administrator Carlos C. Villarreal will be present at a public dedication ceremony of the test track and the SOAC prototypes sometime in October.

OPERATING SUBSIDIES BOGGED IN COMMITTEE

A $20-billion omnibus housing bill—containing, among other items, a controversial proposal to provide $800 million over two years in transit operating subsidies—is making slow progress through the House Banking and Currency Committee. Rep. William A. Barrett (D.-Pa.), whose subcommittee had a draft of the bill ready on May 9, has expressed doubt that it can now be pushed through. But Committee Chairman Wright Patman (D.-Tex.)—accused by some of dragging his feet on the measure—thinks there is still time for a bill this year.

NEW RAILROAD is getting first 300 of the new cars; ICG order is valued at over $5 million.

From P-S: A new family of covered hoppers

Pullman-Standard is making perhaps the most significant changes in the basic design of its complete covered hopper car line since the introduction of the famed standardized PS-2 covered hopper car close to 20 years ago. Twenty-four engineering improvements and optional features—many under laboratory and field test for the past two years—are incorporated into what the carbuilder calls its new "family" of covered hoppers. The family is composed of cars ranging in size from 3,000 feet to 5,800 cubic feet, some with and some without center sills.

Many of the new engineering and design features can be seen for the first time in 300 4,750-cubic-foot-capacity, 100-ton cars the builder is now delivering to Illinois Central Gulf under a contract valued at over $5 million. The first of the three-compartment, with-sill cars are arriving in time to participate in what may ultimately develop into a near-record grain movement in ICG territory this year. There is some concern that corn and soybean harvests coupled with steady and high-volume shipments of export grains from storage elevators to Gulf ports, could put a severe strain on at least portions of the national grain car fleet. One leasing firm, saddled with excess cars earlier this year, reports that all its short-term-lease cars have been snapped up by shippers in recent weeks. Negotiations are now centered on long-term contracts as shippers seek to avoid the anticipated grain-car crunch. As one ICG marketing executive commented, the arrival of the 300 new covered hoppers on ICG property at this critical time "could make us look like the smartest market forecasters in the business."

● **For ConSec, too.** There are other special uses for the new cars, too. As ICG President Alan S. Boyd noted earlier when the new car contract was let, the high-cube cars will be useful in a new grain-rate plan developed prior to merger by Illinois Central's marketing department for high-volume movements. Called ConSec, the rate plan involves consecutive movements of trains of from 50 to 100 carloads of corn and other grains from ICG territory to Gulf ports. Users of the plan must ship at least 10 trains a year, five in a row, to qualify.

Whether they use the ConSec plan or not, ICG shippers should find many of the new orange-and-black cars' features to their liking. Pullman-Standard, in cooperation with ICG, has already taken the initial steps to get grain growers and processors acquainted with the new fleet of cars and the special features. Toward the end of August, one of the first cars off the production line at P-S's Butler, Pa., carbuilding plant was delivered and placed on display at the road's Central Station in downtown Chicago. P-S was also planning demonstrations elsewhere in the Chicago area and in at least one other major grain-processing center.

● **Topside changes.** As grain shippers, ICG personnel and officials of other Chicago area railroads were able to see firsthand during the special car exhibit in Chicago last month, a considerable amount of P-S's re-engineering work is concentrated in the roof area. The roof, including its hatch and running board arrangement, has been made stronger and is capable of doing a better job of protecting sensitive loads from weather

and contaminants. The car also has been made easier to load as a result of the engineering changes made to the trough-type hatch. The new roof features—some of them quite subtle, but nevertheless significant—are:

—Elimination of roof carlines, freeing the hatch of all obstructions except for the hopper compartment partitions.

—New roof shape formed in a combination step-curved arch.

—A sturdier, reinforced hatch coaming.

—Extruded rubber gaskets for the strengthened hatch-cover sections that press snugly on the hatch coaming to seal against infestation and weather intrusion.

—Similar extruded rubber gaskets in completely re-designed cover hold-downs to further improve sealing.

—Improved cover hold-down locks.

—Wider, pressed steel grating for the running boards.

The new roof configuration combined with a longer trough hatch opening, say P-S engineers, enables shippers to get more payload in the car than was possible with the roof of earlier P-S covered hopper designs. The shipper is able to make greater use of the car's available cubic volume because the roof arch and hatch opening permit him to take the fullest, practical advantage of the angle of repose of the product he is shipping.

● **Something for the operator.** Aside from seeking ways of improving the covered hopper so it could better serve the carrier and the shipper and his bulk product, P-S engineers also set their sights on bettering the car's ridability, weight-to-rail-limit ratio, volume and maintainability. In the most popular cube sizes, truck centers have been lengthened and in the process the centers of gravity have been lowered. This makes the cars less susceptible to potentially dangerous rocking at critical speeds. Some other special construction features are:

—Side-post sizes for the straight-sided P-S car are fewer and the posts have been designed wider and shallower than their predecessors.

—The angular side plates are stronger and it is now possible to use the same side-plate design for cars with and without a center sill.

—A forged steel front draft lug arrangement capable of withstanding the higher dynamic forces that are encountered in today's longer, heavier trains.

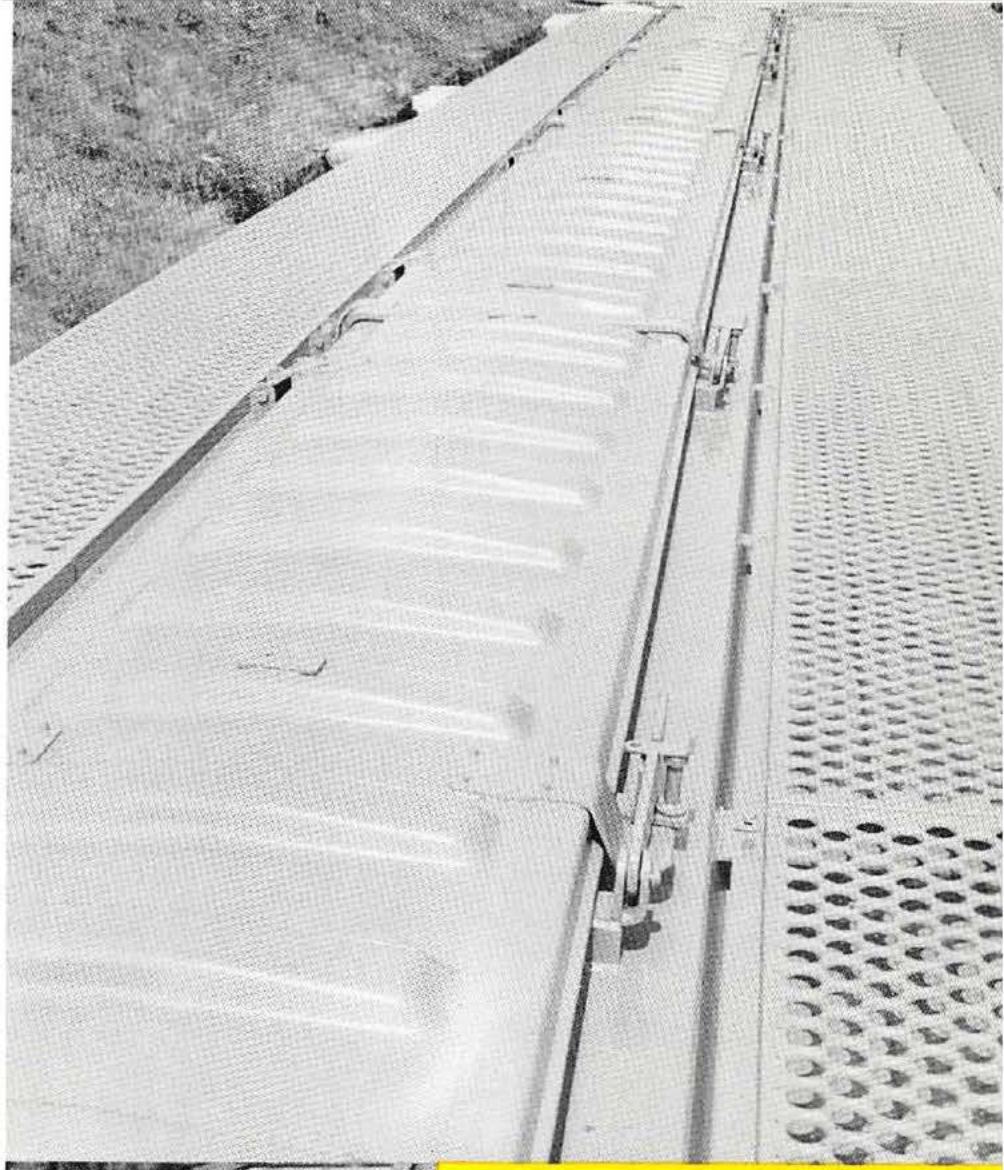
—On cars without center sills, the brake pipe is mounted within rather than below the side sill, thus providing more working room in the unloading area of the car.

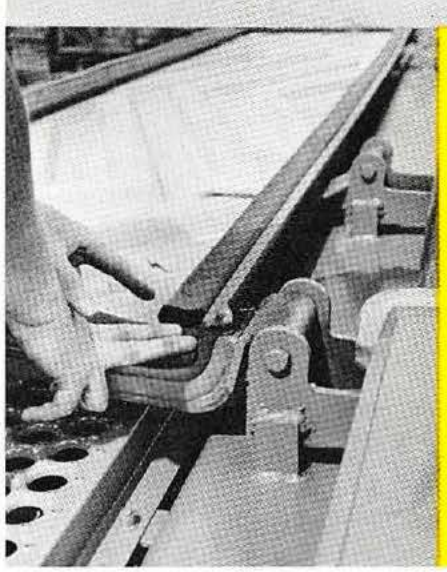
—Ladder rungs have safety guards at their ends.

—Hopper vibrator plates are secured by welding studs on reinforced portions of the hopper chutes.

—Partly as a result of designing the roof carlines out of the car, the interiors are free of many protrusions and angles. Therefore they will more readily accept interior linings.

● **Other orders.** In addition to the cars for ICG, P-S also has received orders for the new, re-engineered covered hopper cars from Grand Trunk Western (50 4,750-cubic-foot cars, similar to those in the ICG order); Chicago Freight Car Leasing Co. (50 car-sets of components for 4,750-cubic-foot-capacity cars); Pullman Transport Leasing Co. (200 5,800-cubic-foot-capacity cars, with 20-inch screw-down hatches and other features specified by the plastics industry). ■





HATCH COVERS and the hold-down devices have been re-engineered and the running boards made wider and sturdier.

It's what's up top that counts

EXTRUDED RUBBER GASKETS in hatch covers are designed to seal out weather and contaminants.

L&N U30C is first to incorporate features of the 1973 line.

GE's XR Series: More than hardware

Can a new locomotive line represent more than advances in hardware? It can, and in the case of the new XR Series does, according to the Locomotive Department of General Electric's Transportation Systems Division.

Late last month, Louisville & Nashville officers, including Prime Osborne, president and chief executive officer, went to Erie, Pa., to accept L&N's newest locomotive from GE. The 3,000-hp gold, black and white U30C was then promptly prepared for movement to the Railway Supply Association exhibition in Chicago. Following this display for the railroad industry, L&N 1499 is destined to move to the home railroad where it will go into heavy freight service.

Increasingly railroads, represented by top officers, are making on-the-spot acceptances of GE motive power. Management of the sprawling Erie works is determined to instill in its men the concept that railroads are people, and not distant corporate entities. Programs intended to familiarize GE employees with their railroad customers are conducted constantly.

● **New involvement.** During customer visitations, GE workers readily converse with railroad executives, inquiring how they individually can help meet a railroad's specific quality challenges. With this new involvement in the locomotive business, GE is finding its staff a growing source of suggestions for improving quality and reliability.

Reliability is the name of the game in the XR (Extra Reliable) Series of locomotives. L&N 1499 and four other units—final deliveries of an order for 30 such locomotives placed in 1971—are the first representatives of this new XR concept. By next year GE will be producing nothing else for the domestic diesel-electric market.

The new locomotive concept has been developed to provide a higher level of availability with consequent lower operating costs. The XR series offers ratings from 1,800 to 3,600 hp with the first units now in production and the entire range becoming GE's new standard line in 1973.

● **More than innovation.** O.F. Vea, general manager of GE's Locomotive Department, said, "The XR Series Locomotive concept encompasses far more than just a new product innovation. It is the result of the work and dedication of more than three thousand highly motivated and skilled employees who are responsible for developing new approaches toward design innovation, improved manufacturing quality and innovative after-sale service. All this is supported by a multi-million-dollar investment in new facilities at the Erie plant."

Railroad mechanical officers have conducted a drive to enhance the reliability of locomotives in the wake of the horsepower race of the 1960s. Builders are now concentrating on locomotive advances at current horsepower ceilings. While GE, for instance, has operated its 16-cylinder engine at 4,200-hp output, and higher, it is not the intention to go above the standard 3,600 hp, "unless railroads really want more," according to C.S. Bressler, manager-marketing.

Bressler notes that GE is expending some 8,000 gallons of fuel per week in test engines "trying to tear them to pieces." It is the feedback from such accelerated life tests that enables engineers to improve designs and develop advanced manufacturing and inspection techniques which enhance locomotive reliability. GE has had four test locomotive units in the field which are soon to be replaced with four newer units. Under construction at Erie is a new test car which will be instrumented to accompany locomotives when they are undergoing road testing.

More than fifty technological and quality advances are to be standard on GE's 1973 diesel-electrics. There are such new designs as:

—Steel crown pistons which operate 15% cooler than those used on the original U25 of a decade ago;

—Fluid amplifier control of the cooling water system which has 90% fewer parts than the previous arrangement (RA, June 12, p. 45);

—CMR (current measuring reactor) wheel-slip control system which takes the place of the individual axle alternators and has better reliability while requiring less maintenance.

From a quality-control standpoint, there are manufacturing changes which involve most thorough inspection. Now all cylinder heads must pass a 3000-psi hydraulic test which is then followed by a 5000-psi test of the complete cylinder assembly, including head, to check the seal of head on liner and of such other precision fits as valves on valve seats. ■

COMING THROUGH... to meet increased rail testing demands

Sperry Rail Service's detector car fleet is expanding to assure that rail testing requirements are met with the latest equipment operated by the most experienced crews. Car 138 is now in operation, soon to be followed by Car 139, twentieth member of the fleet of modern rail detector cars. Keeping pace with industries' needs is just one more reason why leading railroads continue to rely on Sperry Rail Service for efficient economical, end-to-end rail testing.

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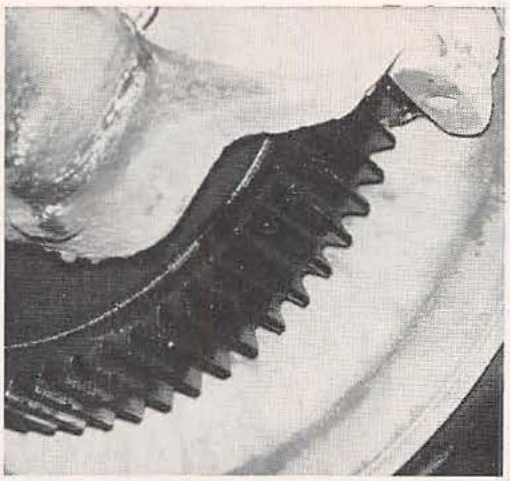
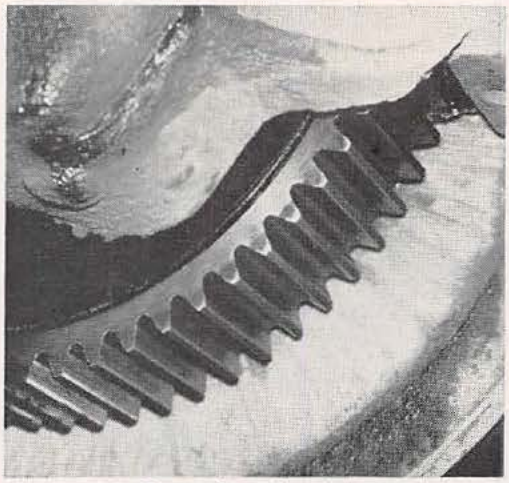


Gear immediately after gearcase was opened.



Gear after cleaning—
no pitting, scoring or feathering.

These pictures show the condition of a "green" gear in a locomotive taken after the crucial break-in period.

The locomotive is just one of 235 high-performance units—1600 to 3600 hp—belonging to a major midwestern railroad that one year ago switched to Dorcia 107 Traction Gear Lubricant. Since this time these units have operated over 18,000,000 miles, without lubrication failure.

The top picture shows the gear of one unit immediately after it was opened. The lower one shows the gear after it was cleaned. Notice there's no trace of pitting, scoring or feathering after traveling over 129,000 miles.

One reason for such outstanding performance is Dorcia 107's excellent mobility—adhering to the upper teeth and draining from the lower teeth. This permits complete coverage of all contact areas and prevents channeling, even in extremely low temperatures.

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In laboratory tests measuring load-carrying ability and anti-wear characteristics, Dorcia 107 proved superior to conventional gear lubricants. In the presence of water, Dorcia still had good adhesion without softening while regular lubes lost adhesion, thinned out or foamed to the top of the gearcase.

Get in touch with your Mobil representative about Dorcia 107 soon. You'll be glad you did. Mobil Oil Corporation, 59 East Van Buren St., Chicago, Ill. 60605.

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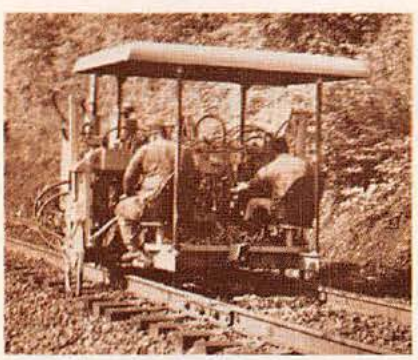

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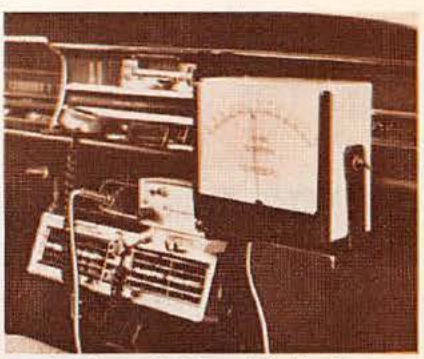

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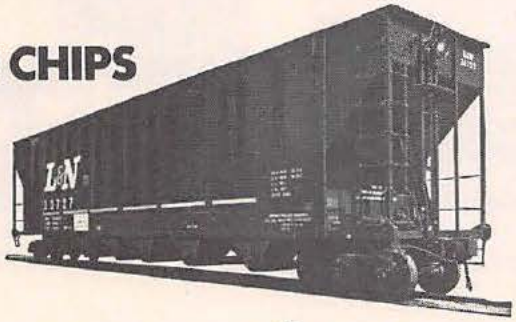
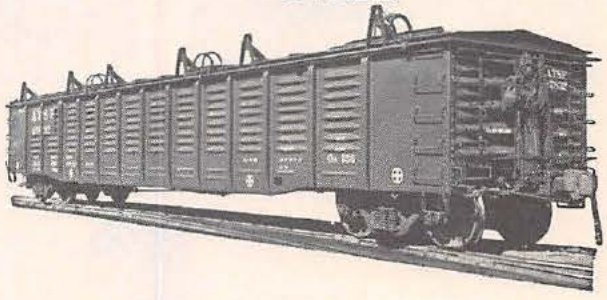


STEEL



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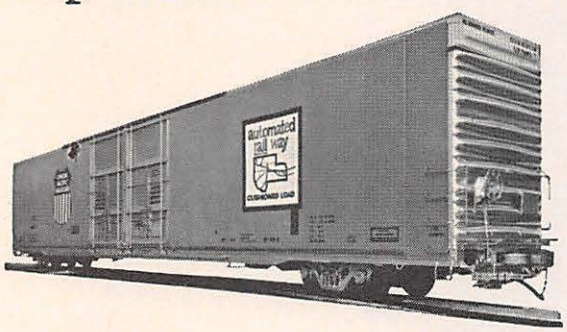

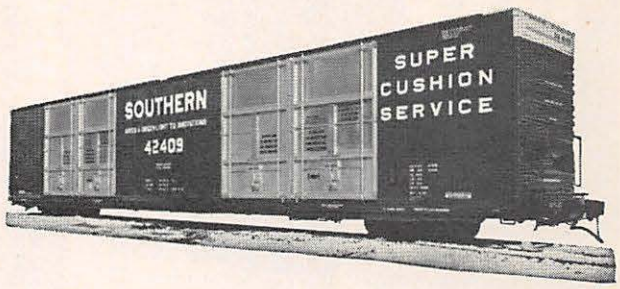

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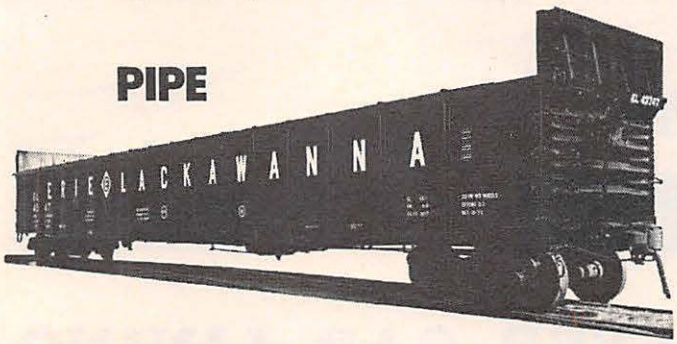

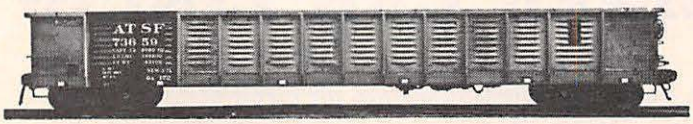

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What the party platforms say about transportation

At the recent party conclaves in Miami Beach, the Democrats and the Republicans struggled mightily with the major issues of the day, including transportation. Not surprisingly, the major emphasis in the transportation planks of both parties was on the passenger side. That's where the votes are.

Being the party in power, the GOP has a record to stand on—and the record of transportation during four years of the Administration is spelled out: Federal assistance to mass transit, creation of Amtrak, a busy R&D program affecting all modes.

There is passing recognition, in the Republican platform, that freight service also exists, and the Administration's commitment to two bills designed to modernize regulatory practices and to help the railroads find money to re-equip is reiterated. But the platform contains nothing new, which many railroad men will view as a blessing since one of the major proposals rejected by the platform committee called for Federal takeover of railroad rights of way.

The word "freight" never appears in the Democratic platform, whose major thrust is anti-automobile and pro-mass transit. (In a white paper released Sept. 7 by the McGovern-Shriver ticket, the attack is intensified: "While America has the world's finest highway system, it may have the world's worst mass transit. Cars contribute to air and noise pollution and the deterioration of the central city. Mass transit can alleviate these problems.")

The full text of the transportation planks follow:

DEMOCRAT

Urban problems cannot be separated from transportation problems. Whether tying communities together, connecting one community to another or linking our cities and towns to rural areas, good transportation is essential to the social and economic life of any community. It joins workers to jobs; makes commercial activity both possible and profitable and provides the means for expanding personal horizons and promoting community cultural life.

Today, however, the automobile is the principal form of transportation in urban areas. The private automobile has made a major contribution to economic growth and prosperity in this century. But now we must have better balanced transportation—more of it public. Today, 15 times as much Federal aid goes to highways as to mass transit; tomorrow this must change. At the same time, it is important to preserve and improve transportation in America's rural areas, to end the crisis in rural mobility.

The Democratic Party pledges:

To create a single Transportation Trust Fund, to replace the Highway Trust Fund, with such additional funds as necessary to meet our transportation crisis substantially from Federal resources. This fund will allocate monies for capital projects on a regional basis, permitting each region to determine its own needs under guidelines that will ensure a balanced transportation system and adequate funding of mass transit facilities.

Moreover, we will:

Assist local transit systems to meet their capital operating needs;

End the deterioration of rail and rural transportation and promote a flexible rural transportation system based on local, state and regional needs;

Take steps to meet the particular transportation problems of the elderly, the handicapped and others with special needs;

Assist development of airport terminals, facilities and access to them, with due regard to impact on environment and community.

REPUBLICAN

When President Nixon took office a crisis in transportation was imminent, as indicated by declining mass transportation service, mounting highway deaths, congested urban streets, long delays at airports and airport terminals, deterioration of passenger train service, and a dwindling Merchant Marine. Within two years the President had proposed and signed into law:

—A $10-billion, 12-year program—the Urban Mass Transportation Act of 1970—to infuse new life into mass transportation systems and help relieve urban congestion;

—A major 10-year program involving $280 million annually for airport development projects as well as an additional $250 million annually to expand airways systems and facilities;

—The Rail Passenger Service Act of 1970 to streamline and improve the nation's passenger train service;

—New research and development projects, including automatic people movers, improved Metroliner and Turbo-trains, quieter aircraft jet engines, air pollution reduction for mass transportation vehicles, and experimental safety automobiles. We strongly support these research and development initiatives of the Department of Transportation.

Four years ago we called attention to the decline of our Merchant Marine due to previous neglect and apathy. We promised a vigorous ship replacement program to meet the changing pattern of our foreign commerce. We also pledged to expand maritime research and development and the simplification and revision of construction and operating subsidy procedures.

By the enactment of the Merchant Marine Act of 1970 we have reversed the long decline of our Merchant Marine.

We affirm our goals set forth in 1968 and anticipate the future development of a merchant fleet that will give us defensive mobility in time of emergency as well as economic strength in time of peace.

To reduce traffic and highway deaths, the National Highway Traffic Safety Administration has been reorganized and expanded, with dramatic results. In 1971, the number of traffic deaths per hundred million miles driven was the lowest in history.

To help restore decision-making to people, we have proposed a new Single Urban Fund providing almost $2 billion a year by 1975 to State and metropolitan areas to assist local authorities in solving their own transportation problems in their own way.

Our proposal for Special Revenue Sharing for Transportation would also help governments close to the people meet local needs and provide greater freedom to achieve a proper balance among the nation's major transportation modes.

To revitalize the surface freight transportation industry, we have recommended measures to modernize railway equipment and operations and to update regulatory practices. These measures, on which Congress still dawdles, would help curb inflation by saving the public billions of dollars a year in freight costs. Their enactment would also expand employment and improve our balance of trade.

The Nation's transportation needs are expected to double in the next 20 years.

Our Party will continue to pursue policies and programs that will meet these needs and keep the country well ahead of rapidly changing transportation demands. ■

LETTERS

Nationalization

Washington, D.C.

To the Editor:

I enjoyed your "Nationalization: Myth and Truth" article (RA, March 27, p. 29) but frankly, I found it to be a bit diffident. Let's face it: The cost of European railroads to their taxpayers is merely a reflection of their paying for what they want: good rail passenger transportation.

Most European railroad economists I've talked to (and I have no reason to doubt them) say that their freight pays its way—at much higher rates than we charge—but would do even better if their government bean counters could be convinced to make the proper investments in more efficient freight equipment.

The situation here is different. The railroads are privately owned. To nationalize them would cost $30 billion to $60 billion dollars. And that expenditure wouldn't improve a thing. It would just change owners.

Quite probably, under nationalization, managerial emphasis would shift to the highly visible (politically) passenger side of the business.

So what would nationalization mean?

1. $30 billion to $60 billion of public funds devoted to merely purchasing what the nation already possesses;

2. Probable reduced employment in freight but more in passenger;

3. De-emphasis on freight transport by rail with a resulting increase in its cost to the public;

4. Vastly more Federal funds in the rail business—mostly directed at new intra and intercity passenger transport.

To this humble observer, these results are not all bad. But I submit we can get whatever the nation is willing to pay for, for *far less money* with private railroads.

Railroads cannot afford to be negative. The railroad industry's position must change. It must approach shippers and the country with the proposition: Tell us what you want in the way of transportation service and we will provide it for you at a fair price including a respectable profit. You can buy a heck of a lot of good transportation for $30 billion to $60 billion. Why waste that money on nationalization?

John W. Ingram
Administrator
Federal Railroad Administration
Department of Transportation

Transit-car design

Michigan City, Indiana

To the Editor:

For all the modern futuristic look that BART is supposed to embody, one would think they could have come up with a better looking car. I speak in particular of the unbalanced drab looking front end which does not provide good front end viewing for the passenger like, for example, PATCO's Philadelphia-Lindenwood cars—of particular importance in generating off-peak joy riding, so important in raising car utilization and net income.

The same criticism can be leveled against New York MTA's Long Island, Harlem, Hudson, New Haven, etc., cars. While PATH cars have the balanced end appearance, the seats are turned the wrong way for viewing out the end, a condition that was corrected on the CTA before the first 6000 Series car was built. CTA has window breakage problems like all the rest of us, but the end windows do not seem particularly vulnerable, if this is the reason the above criticized properties have for their unfortunate choice of design.

William C. Janssen, Asst. Superintendent
Chicago South Shore & South Bend

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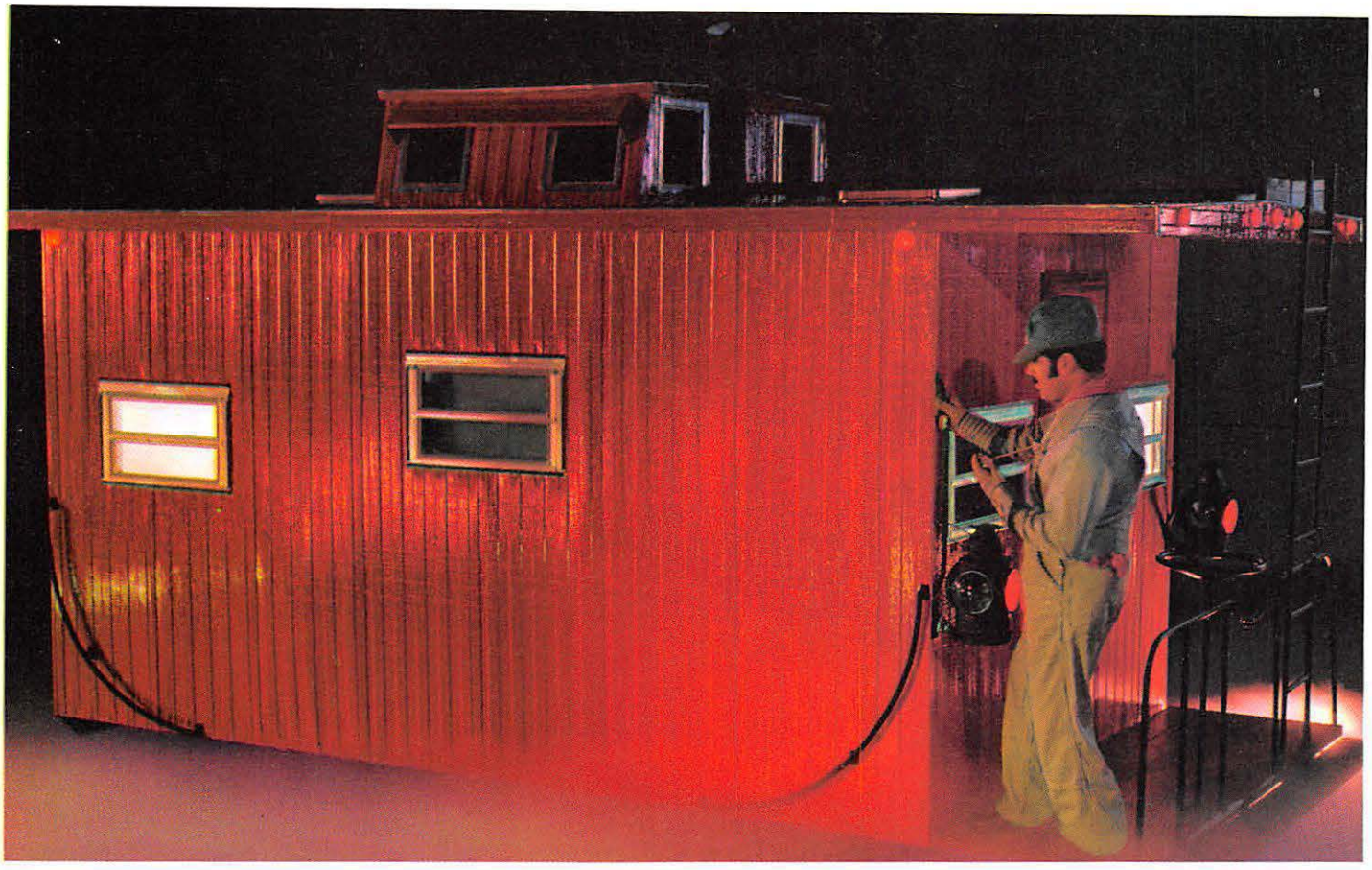
Circle 33 on coupon page 81

Burlington Northern's Ray Spannring wins Shell's 1900 Bobber Caboose



Director of Mechanical Services scored highest in Shell's "Name the Products" Contest.

Ray Spannring, who wrestles with mechanical riddles every working day up in St. Paul, likes a challenge. So he welcomed the chance to match wits with fellow railroaders across the country in Shell's contest.

Ray did his homework. He searched his memory. He dug into the records. He hung in there—and filled in 70 blanks correctly. Terrific! He'll pick up his brand-new old-fashioned caboose at the LMOA Show in Chicago this month.

Congratulations, Ray!

Congratulations, too, to the many well-informed railroaders from just about every road you can think of who entered the contest.

Every one of you will shortly receive a handsomely illustrated and helpful wall chart showing the 51 different applications in the railroad shop, yard, and right of way where Shell products help run a railroad.

We go out of our way to take care of you.

SHELL

Circle 34 on coupon page 81

The second prize winners....

Congratulations to those 15 enterprising railroaders who worked so hard to win one of these beautiful desk sets featuring a magnificent Hamilton Watch Company "Official Railroad" timepiece.

Determining which Shell products apply to which railroading jobs will be far simpler for all of you in the future. Our easy locator wall chart, and our new railroad products catalog will make it easy.

John I. Hillard
Assistant Director,
Mechanical Services
Burlington Northern, Inc.

H. Carlysle Cummings
Lubrication Chemist
Atchison, Topeka &
Santa Fe

William M. Hobart
Electrician Apprentice
Burlington Northern, Inc.

J. M. McGuigan
Chief Mechanical Officer
Penn Central

Robert A. Hobart
Electrician
Burlington Northern, Inc.

Gilbert Dreiling
Chemist
Atchison, Topeka &
Santa Fe

R. D. Drawbaugh
Locomotive Engineer
Santa Fe

L. S. Wood, Jr.
District Sales Mgr.
Southern Railway

R. F. Blakeslee
Asst. Director-Purchasing
Burlington Northern, Inc.

R. J. Chinn
Mechanical Engineer
Illinois Central Railroad

Ray J. Duman
Chief Clerk to Gen. Supt.-
Car Dept.
Milwaukee Railroad

William T. Money
Purchasing Agent
Southern Pacific
Transportation Co.

J. John O'Keefe
Purchasing Agent
Burlington Northern, Inc.

Darrell D. Fisher
Supt.-Car Dept.
The Milwaukee Road

D. N. Engelhardt
District Material Manager
Burlington Northern, Inc.

We go out of our way
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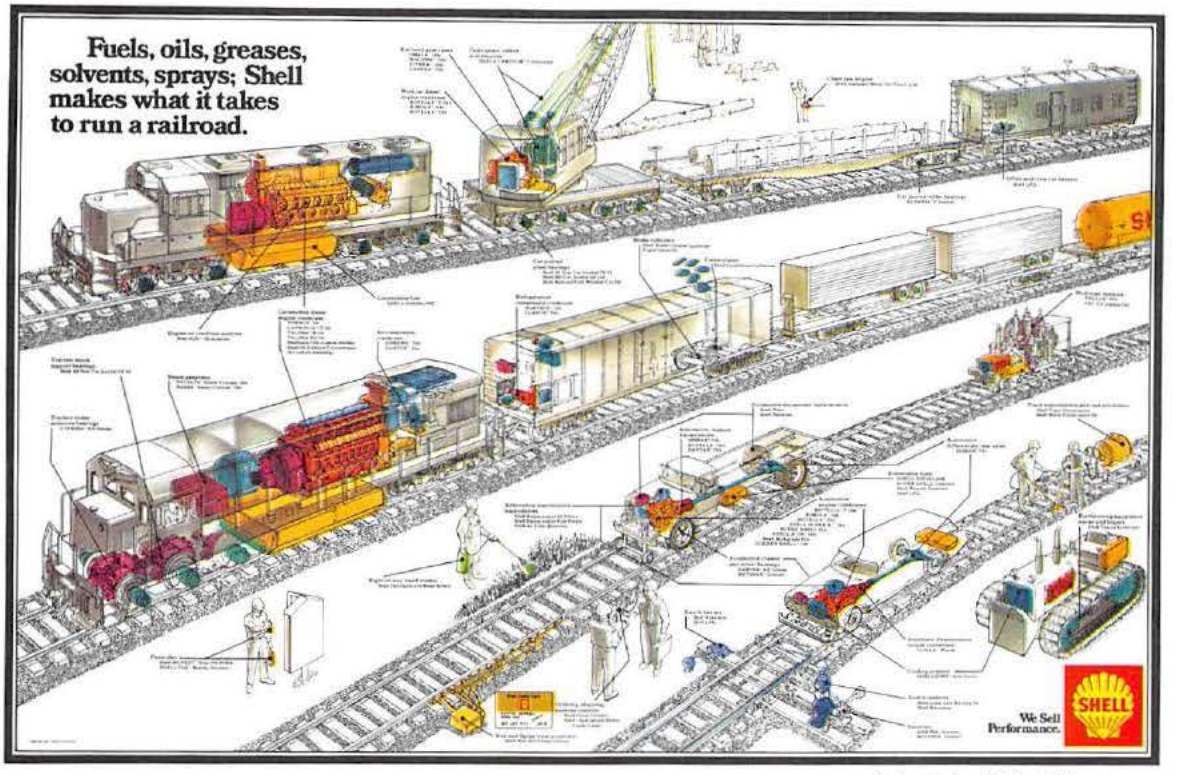
SHELL

These three items may be able to save you more time, trouble and money than you ever thought possible.



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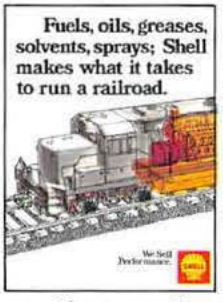

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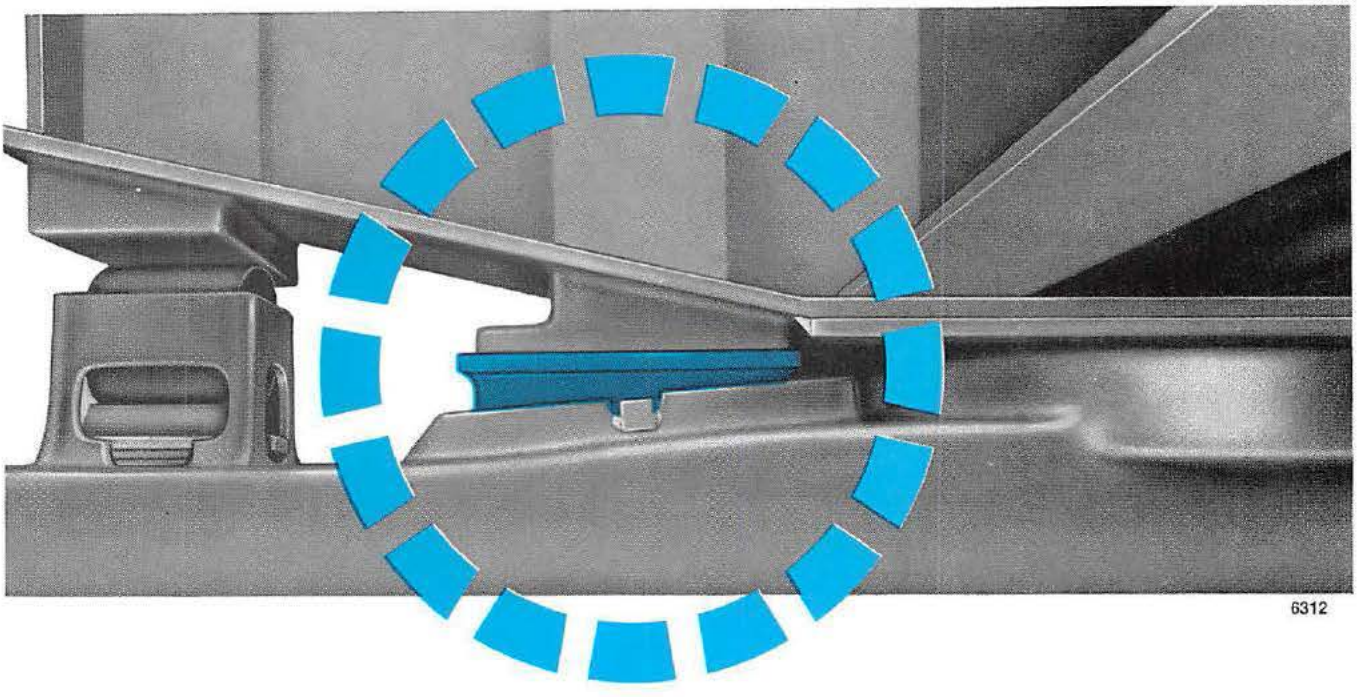

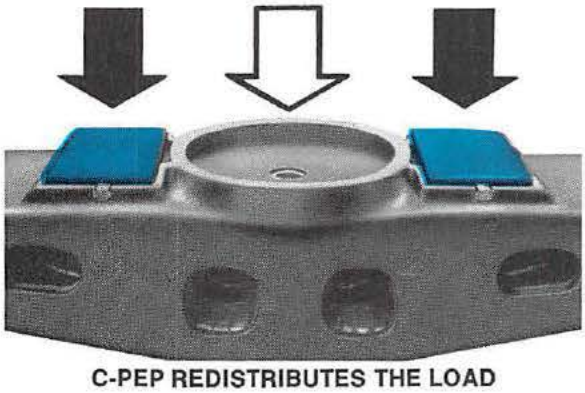

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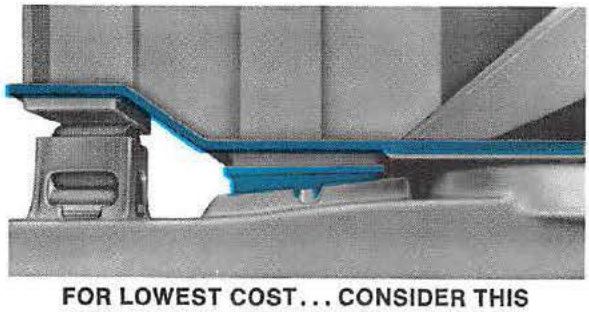

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We've solved the major problems of freight car sway, truck hunting, and dynamic stresses that played havoc with both loaded and empty cars.

C-PEP—our Center Plate Extension Pad system—is a fail-safe, resilient product that effectively enlarges the car-to-truck contact area. C-PEP has introduced rotational control to stabilize truck hunting tendencies and reduce center plate wear on more than 10,000 cars since 1967.

Compatible with BARBER® Stabilized Trucks and other ride systems, C-PEP keeps high center-of-gravity loads and empties on the track!

Save with C-PEP . . . by specialists in freight car stabilization.

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CABLE: CARTRUCKS

Circle 35 on coupon page 81

New Products Report

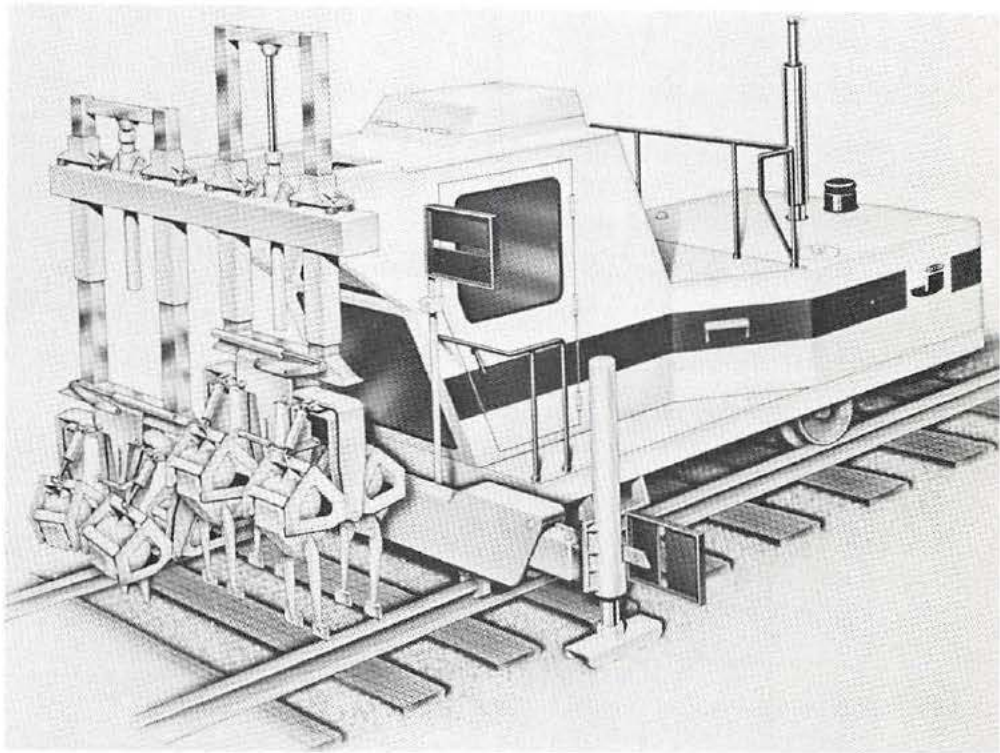
Tamper-liner can work in tight places

A new tamper, designated TampTrak, that raises, cross-levels, lines and tamps up to 1,600 feet of tangent track, has been announced by Jackson Railroad Equipment Co. It will also work 100% of all switches, as well as crossovers, insulated joints and close-clearance and guard-railed sections.

The Model 2600 TampTrak features all-welded construction and a new simplified hydraulic system contained in a workbench-height, hinged cupola atop the cab for maximum accessibility during inspection and maintenance. The operator's cab is fully enclosed for safety and noise reduction, complying with the new Federal noise standards. Vibration is completely isolated from the cab. All of the modular actuated controls are directly in front of the operator.

TampTrak embodies Jackson's patented tilt-squeeze-vibratory tamping action and its lining system that is said to provide accuracy to 1/32-inch tolerances on surfacing, cross-leveling and lining tangents and curves.

Circle 60 on reader service card



Safety control system is for locomotives and transit cars

An electronic alertness safety control system for locomotives and transit cars issues audio and visual warnings and, finally, initiates train brake application if cab personnel fails to perform normal train operating functions. The heart of Vapor Corp. alertness system is an RF antenna network that detects cab movements of the person at the controls. The system cannot be by-passed or circumvented, and since it is electronic, many moving parts are eliminated.

Circle 61 on reader service card.

CTC system combines pushbutton control, minicomputer features

A computer-oriented centralized traffic control system, called Traffic Master II, combines the principles of pushbutton control with the high-speed and volume processing capabilities of a digital minicomputer.

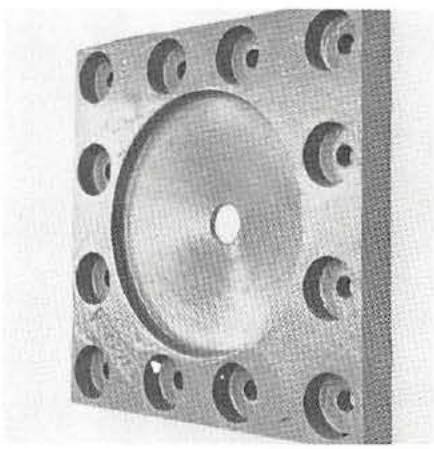
In this General Railway Signal development, the conventional illuminated track diagram is replaced by cathode ray tube displays. Track plan crt's show the over-all track diagram. Above the keyboard console is a crt that will display the controlled location called for by the operator. This display shows the current status of route alignment, signal indications and track circuit occupancies.

Circle 62 on reader service card

Cable system can handle up to 10,800 voice-frequency channels

Type 46V coaxiable communication system can provide broadband terminal and line transmission facilities for up to 300, 960, 2,700 and 10,800 frequency division multiplex voice-frequency channels per pair of coaxial tubes. Manufactured for GTE Lenkurt by Siemens AG of West Germany, the 46V system uses 4.4 mm coaxial tubes for medium-capacity systems and 9.5 mm coaxial tubes for high-capacity systems.

Circle 63 on reader service card



Body center plate is made to eliminate fillet cracking

An inverted, tapered body center plate cast in manganese steel has been designed by Abex to eliminate fillet cracking, particularly on bulk-commodity cars with high centers of gravity. The arrangement has been approved by the AAR for test service in interchange. The plate has operated over 400,000 miles and remains in good condition under unit-train cars where conventional center plates are replaced at an average of 150,000 miles.

Circle 64 on reader service card

Improvements made to Tie Exterminator

Railway Products Company, a division of the Marmon Group, Inc., has been working on improvements and additions to its Tie Exterminator. This diesel-powered machine now features three additions.

The cab, now enclosed for all-weather usage, is available with heater and windshield wiper. The new cab is also larger, for roomy comfort within.

A tie-handling boom is now part of the unit, and a third addition is a horizontal feed conveyor.

These new features are production optionals and the machine is available both with and without these additions. But, it is pointed out, the Tie Exterminator can be used in all weather conditions. There is no need to stop track maintenance because of inclement weather, which results in additional work days and lowers the tie-disposal cost.

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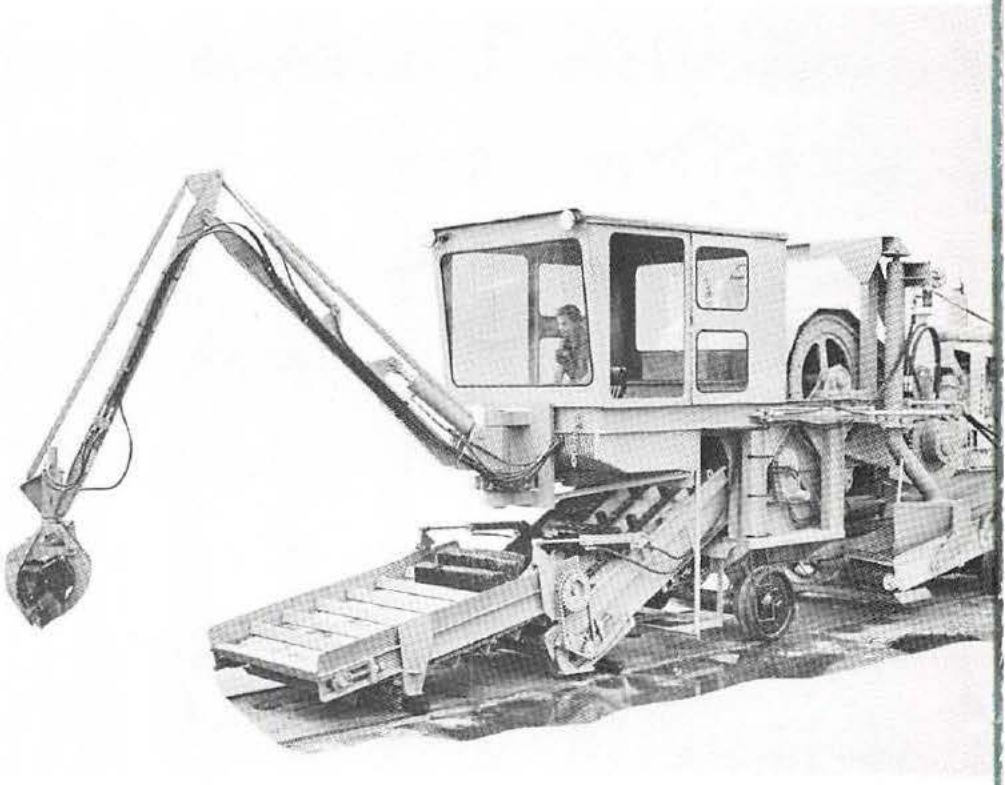
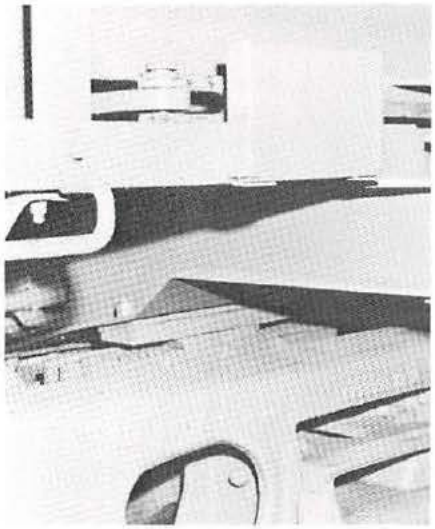
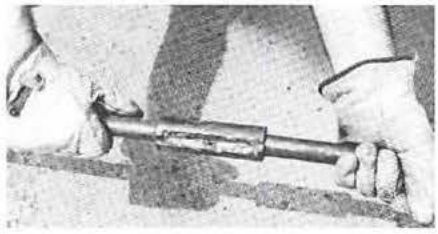




Side bearing stabilizer checks freight-car rocking action

A combination of spring pressures and friction is used in the Unity Railway Supply Co. No-Sway Side Bearing Stabilizer to absorb and dissipate freight car rocking energy. Mounted on the truck bolsters in place of, and in the same location as the conventional side bearing, the No-Sway unit is in constant preloaded contact with the car body side bearing wear plate. As the car body seeks to rock, friction resistance is increased in the stabilizer to counteract the rocking action.

Circle 66 on reader service card



Brake-rod connector develops full strength of original rod

A means of repairing damaged or worn brake rods using the Buffalo Connector makes unnecessary a large inventory of rods. Rods may also be lengthed when necessary. The unit consists of two pieces of heavy pressed steel shaped to fit either 3/4, or 7/8-in. rods. The rod is cut, a new piece of proper length prepared, and a pair of Connectors snapped over the joint where the two pieces connect. The two pieces of the Connector act as a splint when they are welded into place, developing the full strength of the original rod.

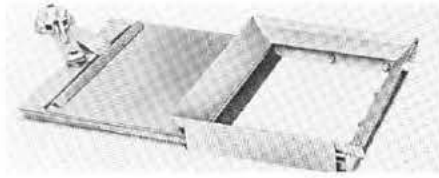
Circle 67 on reader service card

PABX has capacity of 120 lines, 24 trunks; more can be added

The 501 private automatic branch exchange is prewired for 120 lines, 24 trunks. Totally modular construction enable any number of lines, trunks and features to be added at any time by inserting the required plug-in modules.

Wescom's electronic 501 PABX is housed in a cabinet 63 inches high, 42 inches wide, and 26 inches deep, with pushbuttons, telephone dial and indication panel lamps.

Circle 68 on reader service card



Discharge gate does not retain lading when unloading

The Verti-Close discharge gate developed by Chicago Railway Equipment for covered-hopper cars has both frame and gate designed with no ledges or other protrusions to retain lading during unloading. The gate and frame make a complete unit which may be welded or bolted to the carbody with no special fittings or extra parts. The design fully complies with the new AAR specification covering gravity gates.

The gate-operating mechanism has an automatic locking feature which does not activate until the gate is in the fully closed position. On center-discharge type cars, the gate opening mechanism is operable from either side of the car.

Circle 69 on reader service card

Smokeless incinerator meets most air-quality standards

A Trench Burner, which permits smokeless, controlled burning of ties and other railroad waste materials is now available from Railway Maintenance Corp. Smokeless incineration in a trench is achieved by means of a high-capacity blower which directs a curtain of air across the top and down into a prepared trench. The system allows open burning within the air quality standards of most local areas.

The air curtain, a source of oxygen for accelerated combustion of the materials being burned, also serves as a blanket which retains the smoke, gases and other particulate within the trench while they are consumed by intense heat. No auxiliary fuel is required, except for starting.

The air supply is produced by an aerodynamically designed centrifugal fan with backwardly inclined blades, powered by a GMC diesel engine. The great volume of air at a high static pressure is directed downward across the trench at an angle of 30 degrees from horizontal.

With the Trench Burner, ties are consumed at a rate of about 100 per hour in a 40-foot trench. Permanent installations may be considered for terminal areas for incinerating ties and waste generated there as well as refuse shipped from outlying areas. Temporary installations also may be used close to tie-renewal operations.

For effective incineration with the unit, the trench should have a reasonably level bottom and perpendicular sides—length as desired in 8-foot sections.

The Trench Burner is available in models providing for 24-, 32- and 40-foot trenches. Air manifold and blower are easily moved from one site to another. The manifold breaks down into 8-foot sections to be loaded for transfer. The blower unit can be skid-mounted or wheel-mounted.

Circle 70 on reader service card

Gear lubricant is for long, high-speed locomotive runs

Dorcia 107 is a traction gear lubricant introduced by Mobil Oil to meet the demands of long, high-speed locomotive runs through temperature extremes. For over a year the material has been used in all builders' locomotives, including those of highest horsepower ratings.

Mobility at low temperatures assures good coverage of gear contact areas without channeling, although the grease does not adhere to gear cases and drains back rather than extruding through seals. Viscosity is maintained at high temperatures and extreme pressure and anti-wear characteristics are assured through the entire load range.

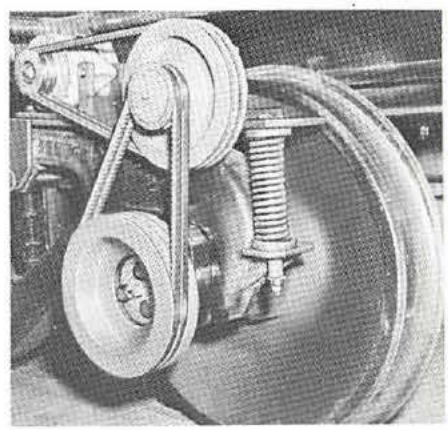
The grease is compounded to assure oxidation stability and will absorb water, alkali or acid solutions without losing its adhesive properties and without foaming. It is packaged in 1- and 2-lb polyethylene bags which are placed directly in the gear cases.

Circle 71 on reader service card

Programmable CTC control system has expandable memory core

System 600 is a programmable control system for centralized traffic control. It employs integrated solid-state circuitry with an expandable memory core and software programming that minimizes changes in hardware and wiring. All units of this Union Switch & Signal development can operate from a 24-volt battery.

Circle 72 on reader service card



Generator drive for cabooses can be installed in two hours

A Dayco Corp. truck-side-frame-mounted drive for caboose alternators features drive ratios of 9:1, 10.5:1, and 13.5:1 to assure low cut-in speed in any service. Installation may be made on

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any axle of the caboose. The standard roller-bearing end cap is replaced with a drive sheave which bolts into the axle end.

A hinged bracket mounted on the side frame supports the plate on which are mounted the alternator and step-idler sheave. The tension spring is mounted on the outer pedestal leg and requires no adjustment. The two pairs of Cog-Belts are of the same size. Installation of the drive can be made in two hours. Since all parts can be reached from outside the rails, it is never necessary to go under the car for servicing or parts replacement.

Circle 73 on reader service card

Plexiglas glazing offers high impact resistance

Plexiglas Insulgard double-glazed units have high impact resistance and usually are mounted in standard sash. The flexible edge seal and dry gas purge are intended to permit these units to reach an equilibrium state free of frosting or condensation. The air space may be 1/4 or 1/2 inch. The light weight simplifies the application and replacement of units. Insulgard units may optionally be glazed with Lexan, a polycarbonate.

Circle 74 on reader service card

Fastening system can be assembled with minimum labor

The Una-Driv fastener consists of a bolt-and-nut combination installed with a fastening tool. Assembly can be made from one side, producing a fast process with minimum manpower requirements. On large, hard-to-join sections, the Lamson & Sessions fasteners can be progressively tightened and retightened to make a firm joint which provides visible proof that each connection has been properly wrenched. Bolt threads can protrude through the lock nut only after the specified torque has been applied.

Circle 75 on reader service card

Polyurethane enamel resists chemical and ultra-violet attack

Railmaster polyurethane enamel, a two-component coating system, is used for finishes on locomotives, cabooses, tank cars and covered hoppers. The Sterling Lacquer Mfg. Co. enamel, hard and resistant to abrasion and wear, is also flexible and tough. It resists chemical and ultra-violet attack, hence is unaffected by fuel spills, acids and salt water. It holds its gloss despite constant exposure to the sun. The chemical stability is enhanced by the lack of porosity which means that color retention and ease of cleaning are among other qualities.

Circle 76 on reader service card

Discharge gate is for covered hoppers, unit-train bulk cars

A Winslow-Atkins gate which "peels," rather than sliding open, has been developed for covered hoppers and a related version may be used for doors on unit-train bulk cars which are to be unloaded rapidly by gravity. The seal is compressed to be air and liquid tight as the gate is shut, not being subjected to any sliding, thus achieving long life. Unit-train cars could have two or four doors each. Openings of each of the double-door arrangements could be as large as 7- by 11-feet. The opening action precludes any friction between the door and the load resting upon it.

Circle 77 on reader service card

Two huge lift trucks offer maneuverability, fast control

Two new heavy-duty lift trucks—the Challenger 700 and 800—have been announced by the Hyster Co. The pneumatic-tired trucks are designed to move containerized cargo and extra-large unit loads: the 700 has a basic lifting capacity of 70,000 lb; the 800 lifts 80,000 lb, both at 48-in. load centers. Each is powered by a standard Cummins diesel engine rated at 254 horsepower, at 2,600 rpm. Maneuverability and fast control response are provided by Hydrostatic power steering and Hyster's exclusive steering axle.

The trucks have two upright sizes available—a 10-ft upright for large capacity lift truck operation and a 20-ft upright for container handling. Both uprights feature heavy-duty construction and excellent forward visibility. Uprights higher than 20 feet are available. An optional container-handling attachment transforms the lift trucks into versatile, complete container handling systems. The attachment can be hydraulically adjusted to fit all ISO containers from 20 to 40 feet long. The attachment fits on the Challengers' conventional or optional high-mounted forks. Containers can be stacked two high with the conventional forks and 20-ft upright; the optional high-mounting forks permit stacking containers three high.

Circle 78 on reader service card

PLACE AIRMAIL STAMP HERE

RAILWAY AGE
350 Broadway
New York, N.Y. 10013

ATTENTION:
R.G. LEWIS, PUBLISHER

AIR MAIL

BUSINESS REPLY MAIL
No postage stamp necessary if mailed in the United States

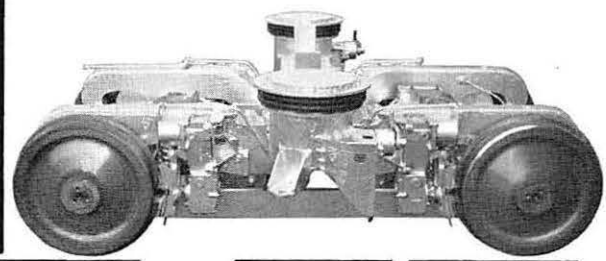
POSTAGE WILL BE PAID BY

RAILWAY AGE
350 Broadway
New York, N.Y. 10013

ATTENTION:
J. MEYER

FIRST CLASS
PERMIT NO. 153
NEW YORK, N.Y.

INNOVATION



You may think GSI trucks look alike from year to year. But every year brings important engineering innovations that make them new again. We're constantly reaching into the future for new principles and new concepts. We do things that haven't been done before . . . to improve the ride, the safety, the reliability of GSI trucks. Emphasis on innovation is your assurance that today's GSI trucks will be up-to-date for years to come.

CASTINGS DIVISION | GSI

MEMBER RPI

GENERAL STEEL INDUSTRIES, INC. • Granite City, Ill. • Philadelphia, Pa. • San Francisco, Calif.

Circle 36 on coupon page 81

RF-444
A.A.R.M-901E
A
B
C
D

Unconditionally A.A.R. approved RF-444 friction/clutch design averages 55,975 foot pounds of proven capacity protection

MEETS & EXCEEDS A.A.R. M-901E SPECIFICATIONS

Showing increased capacity effectiveness by 12.8% during its first two years of A.A.R. service testing, Miner's often imitated but never duplicated friction/clutch design gives railroads their best buy, dollar for dollar. Designed to help protect lading and car equipment with highest reliability by the world's leading draft gear specialists, the RF-444 proved in service that the average capacity at 800,000 pounds reaction force level was 55,975 foot pounds at a travel of 3.25 inches. The reasons why you should specify and purchase this durable gear are:

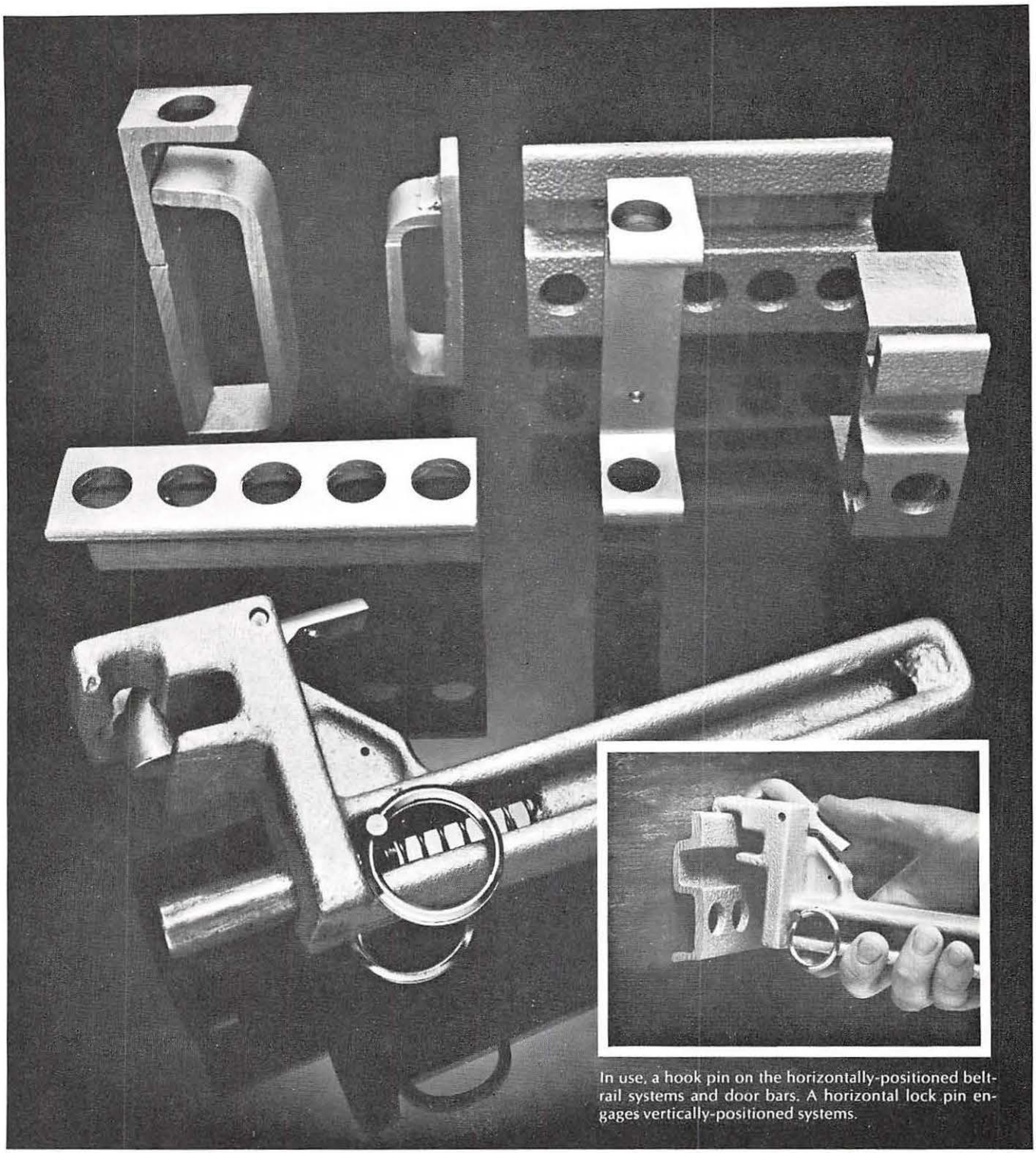
- **A** High tensile steel housing
- **B** Engineered and proven elastomeric units
- **C** Dependable principle of developing frictional resistance
- **D** Hardened forged friction shoes and wedge

MEMBER RPI RAILWAY PROGRESS INSTITUTE

W. H. MINER DIVISION

209 South La Salle Street, Chicago, Illinois 60604
Executive and Sales Offices: 312/236-0110 • Telex 25374
Engineering, Manufacturing & Purchasing: 312/374-7400

MINER ENTERPRISES INC.



In use, a hook pin on the horizontally-positioned belt-rail systems and door bars. A horizontal lock pin engages vertically-positioned systems.

Solved! The load-restraining bar problem.

Now! USG® Multi-Lock Head helps you forget about "lost" load-restraining bars. Fits existing and new bars and over 90% of existing belt-rail-equipped cars. A hook pin locks firmly into horizontally-positioned belt-rail systems and door bars. A horizontal lock pin secures vertically-positioned rails. Provides up to 8 inches of adjustment to accommodate varying car widths. Example: car widths from 108" to 115½". See your U.S.G. Sales Engineer for details. Or mail the coupon today for more information on the Multi-Lock Head.

United States Gypsum, 101 S. Wacker Dr., Chicago, Ill. 60606, Dept. RA 92

☐ Have salesman call ☐ Send more information

Name_____

Company_____

Address_____

City_____ State_____ Zip_____

UNITED STATES GYPSUM
BUILDING AMERICA

Circle 12 on coupon page 81

People in the News

ASSOCIATION OF AMERICAN RAILROADS.—**Richard P. Hoffman** named project manager in track-train dynamics in the AAR's National Research Program being conducted at Illinois Institute of Technology, Chicago. Mr. Hoffman is on a two-year loan to the association. He has been manager of train accident prevention, **Chicago & North Western.**

BURLINGTON NORTHERN.—In the management services and planning department, **J.J. Cook** named director, planning and data administration, and **J.R. Spitzmueller,** director, management control systems, both newly created positions. **G.C. Krahn** appointed director, data systems and production.

In the marketing department's intermodal sales division, **R.J. Class** named director, passenger services (AMTRAK), St. Paul, to succeed **W.F. Burke,** who retired Aug. 1.

CHESAPEAKE & OHIO/BALTIMORE & OHIO.—**John W. Hanifin,** vice president, executive department, elected executive vice president, Cleveland.

CHICAGO & NORTH WESTERN.—Has established a grain marketing and pricing organization as a subdivision of the sales and marketing department. **James R. Feddick,** general market manager, named director of the new unit.

DELAWARE & HUDSON.—**Harold J. Farley,** general superintendent, Albany, N.Y., appointed vice president-operations, succeeding **J.R. Neikirk.**

W.D. Slater, engineer maintenance of way, Albany, promoted to chief engineer, succeeding **R.F. Bush. R.J.D. Kelly,** assistant to chief engineer, promoted to assistant chief engineer. **D.E. Hoadley,** construction engineer, succeeds Mr. Kelly. **H.E. Schultz,** bridge and building master, appointed engineer maintenance of way. **W.H. Lloyd,** office engineer, appointed engineer plans and construction. **C.H. Close** named engineer of budgets and costs. **P.R. Kross** appointed engineer signals and communications. **E.M. Dower,** bridge and building supervisor, Oneonta, N.Y., appointed engineer bridges and buildings there. **W.R. Snyder,** supervisor work equipment, Watervliet, N.Y., appointed supervisor of work equipment and welding, Colonie, N.Y.

DETROIT, TOLEDO & IRONTON.—**L.W. Klenk** appointed general sales manager-automotive, steel and coal products, and **R.J. Gunton** appointed general sales manager-merchandise traffic, Dearborn, Mich. **C.F. White** named district sales manager, New York.

ERIE LACKAWANNA.—**Jack D. Mangrum** appointed district sales manager, Dallas, Tex.

J.A. McQuiston, general signal inspector, Hoboken, N.J., retired July 1, after more than 43 years of service. **James M. Rossi** appointed assistant engineer, Cleveland.

FLORIDA EAST COAST.—**Dan E. Marlow,** sales manager-rail highway, Atlanta, Ga., appointed regional manager-sales and service, succeeding **Raymond L. Colquitt,** who retired Aug. 31 after 47 years of service. **A.L. Johnson,** district sales manager, promoted to assistant regional manager-sales and service. **R.F. Yadon** appointed district sales manager.

FRISCO.—**Robert E. Carter** appointed recruiting officer, Southern division, Memphis, Tenn.

GULF, MOBILE & OHIO.—**L.A. Marlin,** assistant freight traffic manager, Chicago, retired Aug. 21, after 55 years of service.

ILLINOIS CENTRAL.—**Walter P. Schindel,** regional sales manager, appointed to the newly established position of director of gateway traffic, with headquarters remaining at St. Louis.

ILLINOIS CENTRAL GULF.—Officers are **Glen P. Brock,** chairman; **Alan S. Boyd,** president and chief executive officer; **B.V. Bodie,** senior vice president-operations; **Henry F. Davenport,** vice president-executive department; **E.B. DeVilliers,** senior consultant-traffic; **John B. Goodrich,** secretary-treasurer; **J.C. Humbert,** vice president-operations; **Harry Hunter,** chief medical officer; **Frank Lott,** vice president-subsidiary activities; **Y.D. Lott,** vice president-finance; **Harry C. Miller,** vice president-materials management; **John D. Mitros,** assistant vice president-corporate relations; **Donald R. Montgomery,** comptroller; **R.A. Navin,** assistant vice president-economic

(Continued on page 94)

Train Billing Repair Card Write-Up Men

How many Repair Cards are rejected each month? To reduce that number, sign up for our new home study course for Write-Up Men.

This course consists of fifteen lessons as follows:

1. Purpose of the Rules of Interchange and Care of Foreign Cars.
2. Air Brake Equipment.
3. General Regulation for Lubrication.
4. Components of Journal Box.
5. Roller Bearings, Adapters and Cartridge Bearings.
6. Wheels and Axles—Components of Trucks.
7. Running Boards—Dome Platforms—Brake Steps—Cross Over Platforms—Repair to Sills.
8. General Repairs and Instructions.
9. Material and Interchange of Freight Cars.
10. Responsibility.
11. General Regulations for Pricing and Billing General Rules.
12. Review of Entire Book.
13. The A.A.R. Billing Repair Card Basics.
14. Practice Problems—Part 1.
15. Practice Problems—Part 2.

The cost is $3.00 per lesson ($45.00 total) and includes a 1972 Field Manual, grading of all examinations and monthly progress report to your Railroad.

Upon satisfactory completion of the course, a diploma will be issued.

Start your course right away by returning the coupon below.

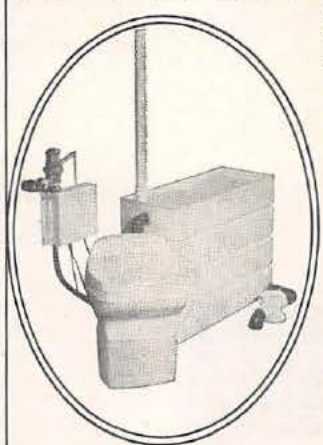
RAILWAY EDUCATIONAL BUREAU
1809 Capitol Avenue, Omaha, Nebraska 68102

Please enroll me in the A.A.R. Billing Repair Card Course. Here is my check for $3.00. I will pay $6.00 per month for seven additional months ($45.00 total). I understand I may cancel at any time.

NAME_____
ADDRESS_____
CITY_____ STATE_____ ZIP_____
RAILROAD_____
TITLE_____

Microphor
LEADS THE WAY

Our H Series Railroad Waste Treatment Unit Produces Effluent That Meets Tough Anti-Pollution Standards — And It Needs No Support Equipment



An independent research laboratory has certified that effluent from Microphor's waste treatment unit meets anti-pollution standards recommended by the Association of American Railroads*. It's got these other outstanding features • Compact, simple, easily-installed • Minimum maintenance • Operates on train air • No holding tanks required • Saves water.

Microphor's H Series Flow-Through Sanitary Unit — ideal for installation in: Locomotives • Cabooses • Crew Cars • Passenger Cars • Drawbridges • Tugboats. **Contact Microphor Today.**

*—Certified by Stewart Laboratories, Knoxville, Tennessee

For sales Information: **MICROPHOR**
P.O. Box 490/Willits, Calif. 95490/Phone: AC (707) 459-5563

Circle 39 on coupon page 81

General Electric progress in

Parts centers, service shops, and field service forces form backbone of product service network

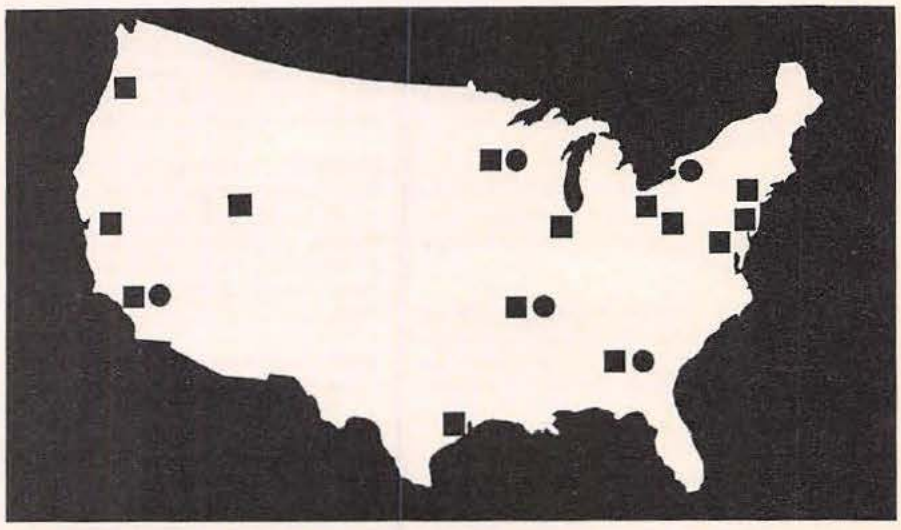
At General Electric's Transportation Systems Division, total service just begins with the sale . . . of its locomotives, transit and commuter cars, diesel engines and off-highway vehicle equipment.

GE's Transportation Industries Sales and Service Department, headquartered in Erie, Pennsylvania, maintains a complete national network of service facilities including regional distribution of transportation renewal parts, regional rebuild, repair and remanufacture of transportation equipment, and expert qualified transportation maintenance supporting services.

Fourteen General Electric Service Shops, specializing in transportation equipment repair and rebuilding, are strategically located throughout the United States. These shops are equipped to provide three kinds of fast, high quality repair service for major transportation components:

Limited repair and return . . . A program under which a customer specifies repair or replacement of components . . . the repair is made, and the same piece of equipment returned.

Complete repair and return . . . In this more comprehensive reconditioning, technicians inspect and repair or replace all parts necessary to restore the equipment to its original quality operating condition . . . and return it to the customer.



- ● GE Regional Parts Centers
- ■ GE Transportation Service Shops

●■ Atlanta
■ Baltimore
■ Chicago
■ Cleveland
● Erie
■ Houston
●■ Los Angeles
●■ Minneapolis
■ New York City
■ Philadelphia
■ Pittsburgh
■ Portland, Ore.
●■ St. Louis
■ Salt Lake City
■ San Francisco

Unit exchange . . . A General Electric "total service" concept whereby a customer may receive immediate delivery of totally rebuilt and fully warranted equipment. Under this program, GE service locations stock items which have undergone complete overhaul. When a phone order comes from a customer, the item, such as a traction motor, is immediately shipped from existing GE stock. The customer then forwards his equipment to GE.

GE's strategically located centers are staffed by transportation renewal parts sales engineers who give valuable on-the-spot, personalized customer assistance throughout equipment service life and assure timely shipment of renewal parts and components.

Computer analysis of stock supply, scheduled maintenance orders, and projected demand, provides a vital link between Regional Parts Centers and the Transportation Renewal Parts Distribution Center in Erie, Pennsylvania.

Prompt parts availability from five Regional Centers

Strategically located in Atlanta, Erie, Los Angeles, Minneapolis and St. Louis, GE Regional Parts Centers not only provide key parts but also serve as a continuous interface between the customer and the factory.

Utilizing the latest in computer analysis techniques to project demand for replacement parts, they provide invaluable 24-hour-a-day, seven-day-a-week service to assure prompt delivery. The result: further assurance of prompt customer service, helping maintain maximum "in revenue service time" for GE transportation equipment. Whether it is a replacement part, assembled component or Unit Exchange item, it is available from a stock of thousands of items.

Any item stocked by a GE Regional Parts Center can be delivered anywhere in the United States within 24 hours.

In addition to immediate parts service, a Customer Service Specialist is assigned to each of GE's land transportation customers to see that his needs are met with the right parts, at the right place, at the right time.

transportation service

General Electric transportation systems
ERIE, PENNSYLVANIA 16501

New GE Parts Distribution Center geared to serve customers' needs promptly

Whether it's a tiny cotter key weighing a fraction of an ounce, or a 3-ton diesel engine, GE's modern Transportation Renewal Parts Distribution Center in Erie, Pa., has it, or can get it in a hurry to meet customer service needs.

GE's new $4.5 million Transportation Renewal Parts Distribution Center contains 150,000 sq. ft. of storage and operating space and is equipped to move more than 24,000 stock locomotive, transit and commuter car, and off-highway vehicle parts with modern, automated equipment.

A new stacker crane has been installed to speed handling of parts shipments to Regional Parts Centers, and therefore, to customers.

Under GE's new Scheduled Orders Program, when a customer itemizes the parts he needs for routine maintenance the Center's computer tracks the schedule and automatically sends the parts out on schedule during the year. Scheduled maintenance helps keep locomotives and transit cars available for revenue service.

GE's five Regional Parts Centers receive appropriate stock items from the Erie Distribution Center while an additional 90,000 parts are available on an as-required basis to take care of more infrequent customer needs.

Technical assistance always nearby

GE's land transportation customers are supported by more than 80 experienced transportation installation and service engineers located throughout the United States.

Customers find that knowledgeable, technical assistance is always nearby. The out-of-service transit car or locomotive is never very far from GE's reliable transportation service engineering support.

Grove City facility cuts customer maintenance costs by remanufacturing diesel engines

General Electric's after-sales service includes a complete new diesel engine remanufacturing facility at Grove City, Pa.

Under complete or limited repair, and Unit Exchange programs, the new Grove City Diesel Engine Remanufacturing facility provides customers with new engine quality and performance through economical rebuild and modernization.

All engine components are cleaned, renewed to the latest design or specification, or replaced. After reassembly, the engine undergoes a comprehensive test program, including engine break-in and tuning of the fuel injection system. This is followed by a four-hour full power test run. Comprehensive crankcase and external inspections are made both during and after testing.

Unit Exchange engines are given a warranty of 12 months of service, or 100,000 miles.

OUR NO. 1 GOAL:
TO MAKE
GENERAL ELECTRIC
YOUR BEST BUY

GE BEST BUY
Our No. 1 Goal
QUALITY...SERVICE...VALUE

121-56

After sales service... a vital link in transportation progress

GE's Transportation Industries Sales and Service Dept. is committed to providing its customers with Best Buys in quality, service and value for whatever their needs . . . new locomotives, transit cars, off-highway drives, high-quality repair or exchange components, highly qualified service engineers, and a full range of replacement parts. We're backing our commitment to total customer service with investments in people and facilities dedicated to helping our customers provide more efficient land transportation services.

Norman W. Selp
General Manager
Transportation
Industries Sales and
Service Dept.

General Electric Company
Transportation Systems Division
Erie, Pennsylvania 16501

GENERAL ELECTRIC

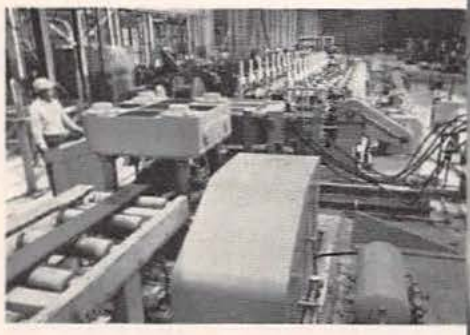
Circle 40 on coupon page 81

Our new NSF® plant will floor you.

There is none other like it. It can make Nailable Steel Flooring faster and to greater precision than ever before.

Our new plant at Portage, Indiana, was engineered and newly built to be the industry's most modern manufacturing facility for Nailable Steel Flooring. This means we can deliver top-quality flooring, made to your specifications, in the quantities you need, when and where you need it.

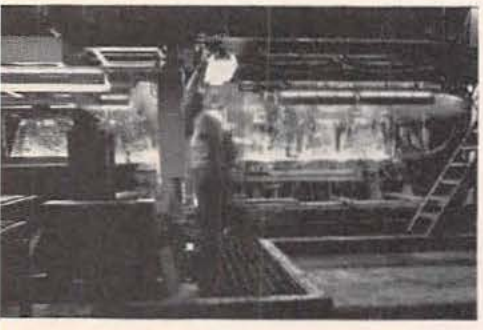
Technically speaking, our new plant is a fully integrated, semi-automated forming and welding mill. When you boil all that down, it simply means we can produce a superior Nailable Steel Flooring.



The production process starts with a custom-designed, eleven-stand forming mill (photo far right) that shapes the main flooring channel from a continuous coil of high-strength steel. Beside this mill is a similarly designed, seven-stand Yoder mill that forms the reinforcement channel.

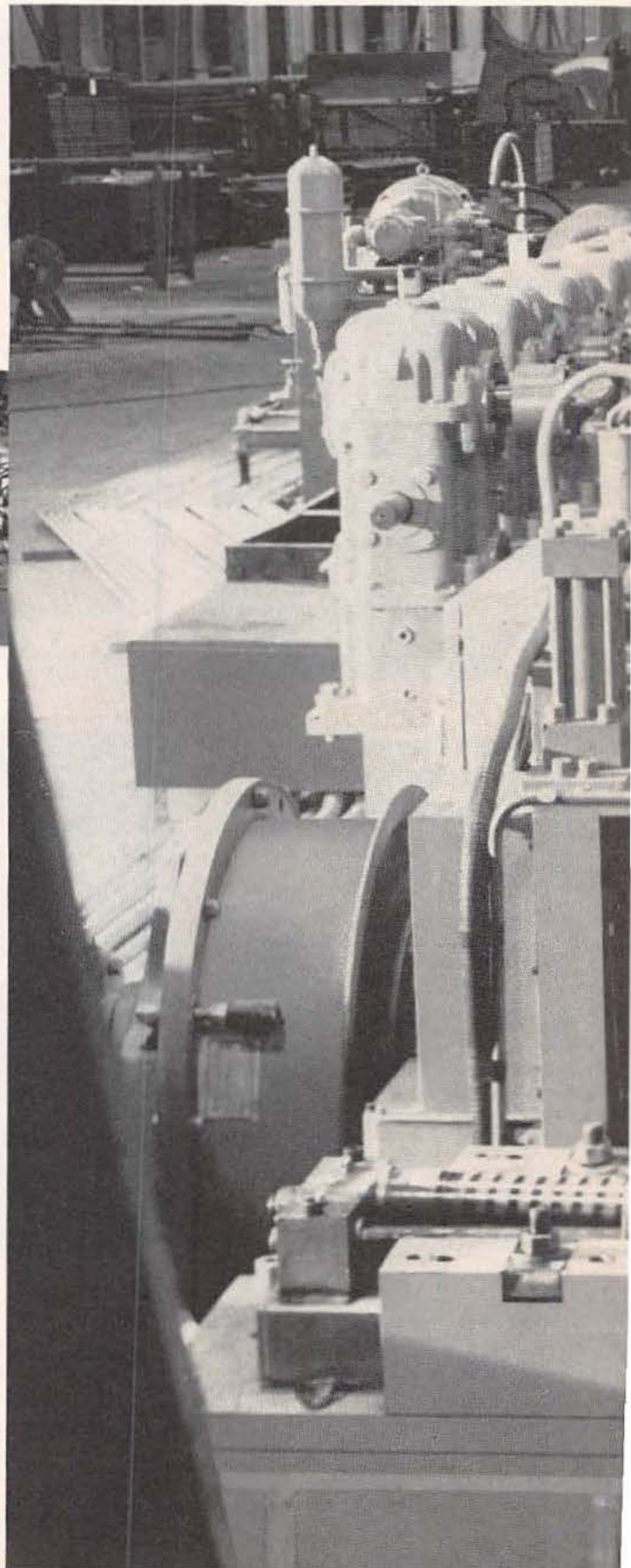
After forming, the channels are automatically cut to length (photo above) and conveyed to the automated welder (photo below). There the channel and reinforcement are brought together, positioned precisely, and automatically arc welded. The result is a rigid, strong, precisely dimensioned product.

And through every step, our Quality Control team continually measures, inspects and sometimes rejects the products in process. We make sure you receive exactly what you ordered . . . the best product possible.



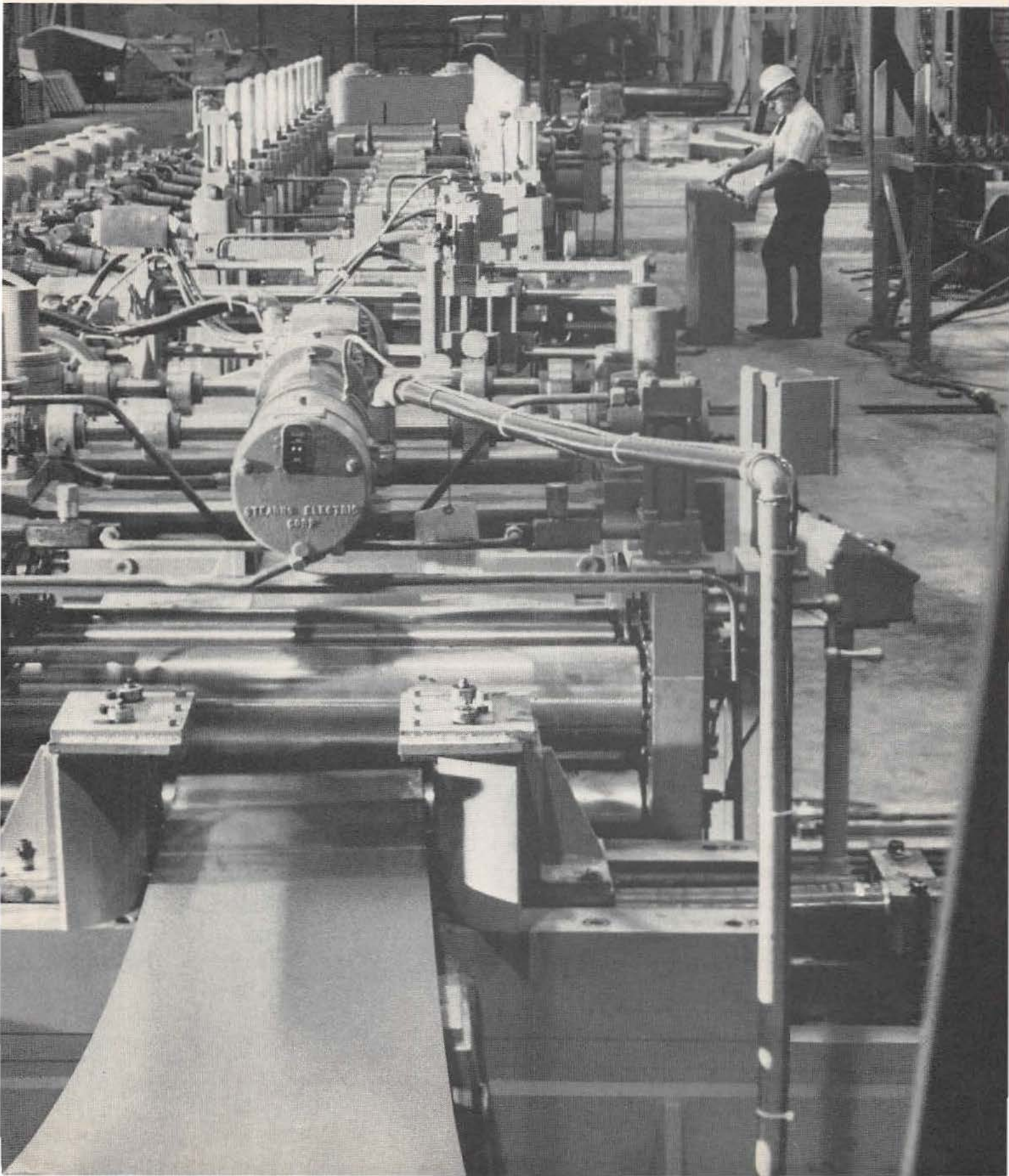
We made a substantial investment in this unique facility to serve your needs better; to provide you with the most reliable source of quality Nailable Steel Flooring. We are proud to say that, now, what you buy from us is made by us. ***And we'll stand on that, any time.***

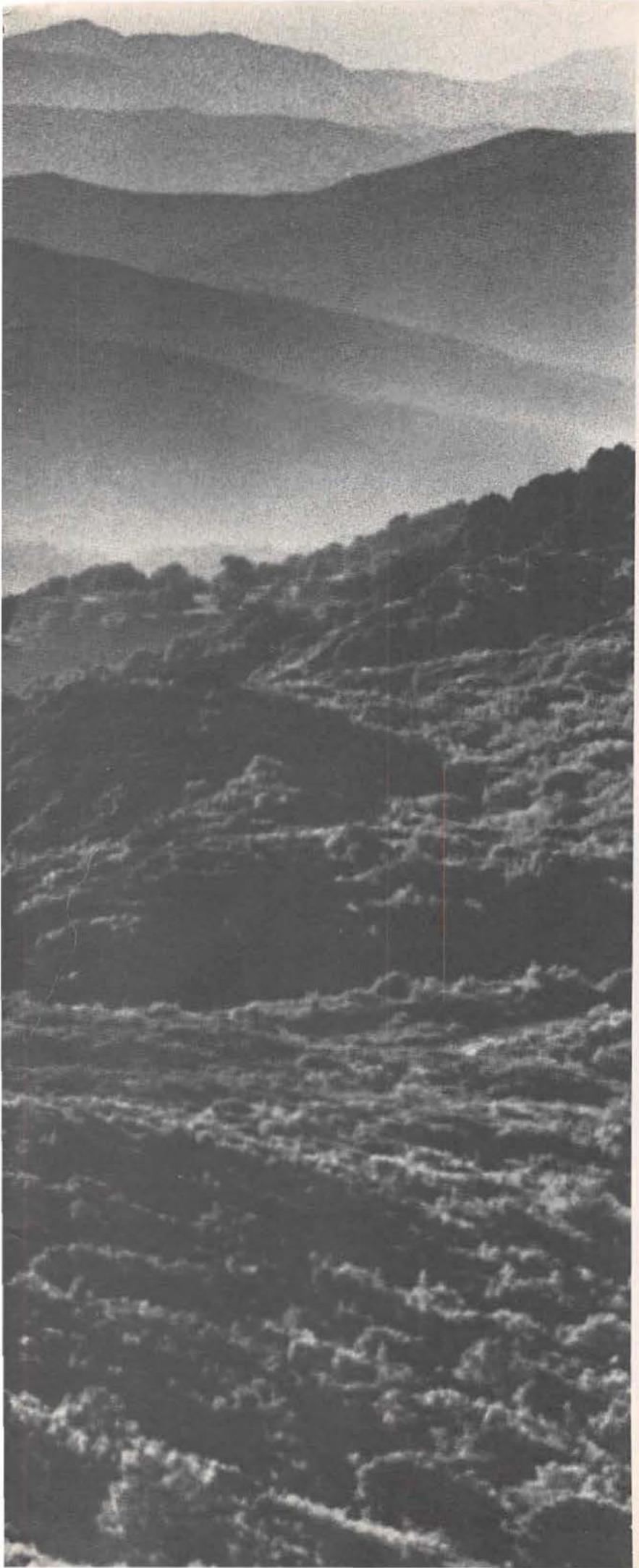
If you'd like a tour of our plant, come see us at booth number 238-A at the Railway Supply Association Exhibit in the Sherman House Hotel, Chicago, September 17-20.



Transportation Products
Division of
National Steel Corporation

Circle 41 on coupon page 81



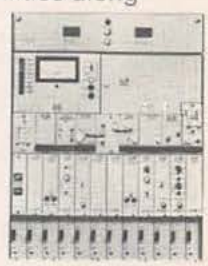


We have a compact, reliable microwave system that fits very nicely in the middle of nowhere.

It's a combination of two GTE Lenkurt systems—the 36A Radio Multiplex and the 78F2 2-GHz Microwave Radio.

Together, they give you the size and reliability needed for voice and data transmission at remote locations for railroads.

A 12-channel system, both multiplex and radio, takes less than 23″ on a standard 19″ equipment rack. So chances are good it'll fit easily in existing facilities along the line.



Specifically, the 36A multiplex has been designed for light route service. It's expandable in single channel increments up to 72 channels. And, up to 192 channels using supergroup equipment.

All channel units are identical, with the frequency determined by a plug-in oscillator. This allows a considerable savings in spare-parts inventory—instead of complete channel units for each operating channel, you only need a single channel unit and a spare plug-in oscillator for each operating channel.

The 78F2 radio provides pushbutton metering on the front panel for fast, simple routine maintenance and fault location—even to individual subassemblies. And all routine maintenance can be done without interrupting service.

Together, the 36A and 78F2 make a compact, reliable system, anywhere and everywhere.

To find out more, write GTE Lenkurt, Microwave Systems, 1105 County Road, San Carlos, CA 94070.

GTE LENKURT

Circle 42 on coupon page 81

Whiting finds so many ways to cut your service costs

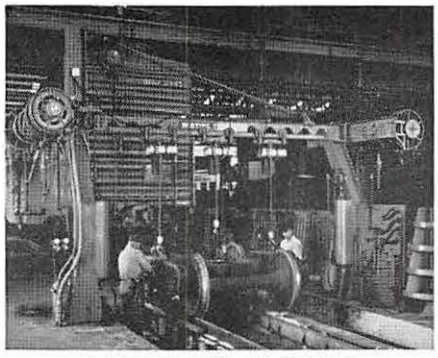
There are an encouraging number of new ways to shave time from maintenance schedules. Your Whiting engineer can show you most of them.

Our reputation for improving rolling stock service techniques has led to some interesting assignments. Like developing *complete systems* for Progressive Spot Repair, for washing out covered hopper cars, for filling locomotive sand boxes faster, for moving and spotting cars by remote control.

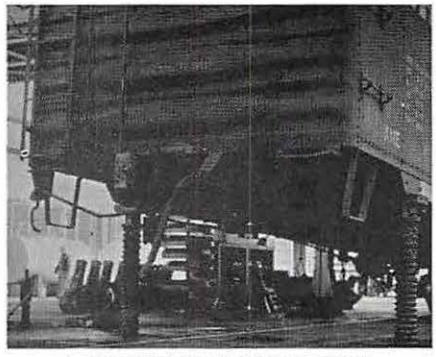
If *you* are considering new or modernized maintenance facilities, let's get together and discuss *all* the ways to save money.

ASK FOR Bulletin GT-104 describing Whiting ROBOT Remote Control Car Progression Systems for a wide range of repair and service operations.

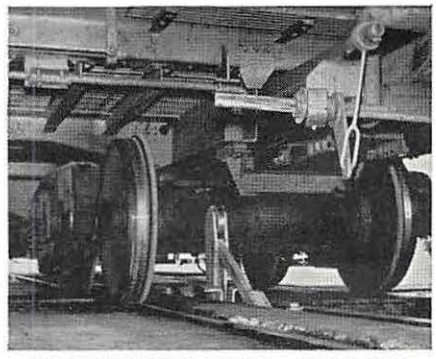
WHITING CORPORATION
HARVEY, ILLINOIS 60426 U.S.A.



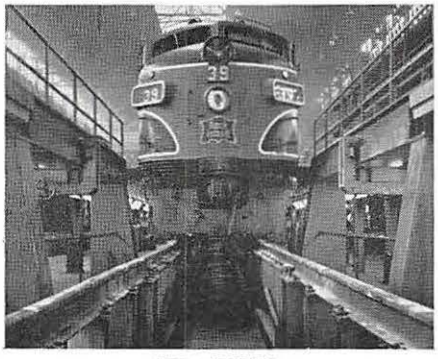
REPAIR STATION JIB CRANES



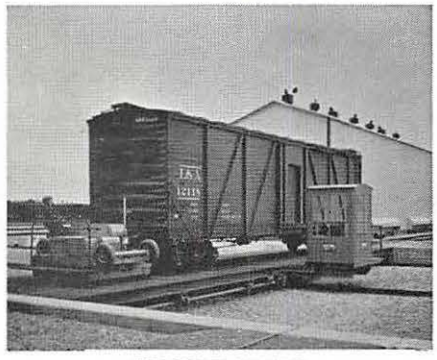
LATERALLY ADJUSTING RIPJACKS



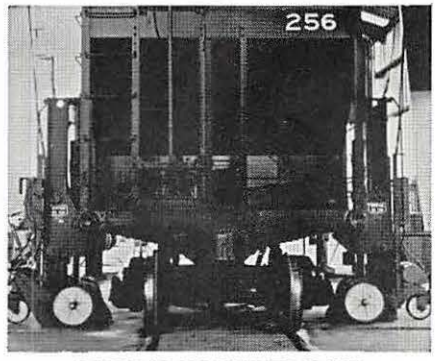
"ROBOT" REMOTE CONTROL CAR MOVERS



DROP TABLES

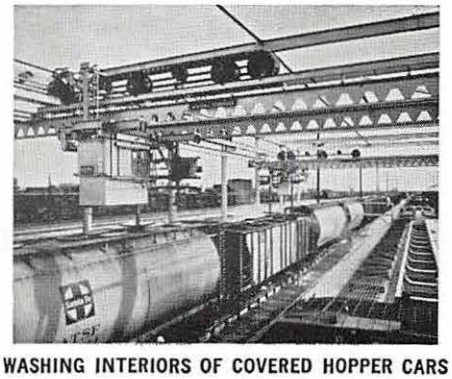


TRANSFER TABLES



PORTABLE JACKS UP TO 50-TON

TRAIN WASHING SYSTEMS



WASHING INTERIORS OF COVERED HOPPER CARS

LOCOMOTIVE SERVICE GANTRIES

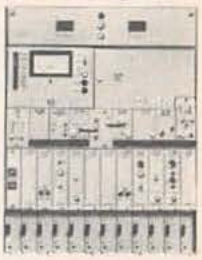
Circle 46 on coupon page 81

We have a compact, reliable microwave system that fits very nicely in the middle of nowhere.

It's a combination of two GTE Lenkurt systems—the 36A Radio Multiplex and the 78F2 2-GHz Microwave Radio.

Together, they give you the size and reliability needed for voice and data transmission at remote locations for railroads.

A 12-channel system, both multiplex and radio, takes less than 23″ on a standard 19″ equipment rack. So chances are good it'll fit easily in existing facilities along the line.



Specifically, the 36A multiplex has been designed for light route service. It's expandable in single channel increments up to 72 channels. And, up to 192 channels using supergroup equipment.

All channel units are identical, with the frequency determined by a plug-in oscillator. This allows a considerable savings in spare-parts inventory—instead of complete channel units for each operating channel, you only need a single channel unit and a spare plug-in oscillator for each operating channel.

The 78F2 radio provides pushbutton metering on the front panel for fast, simple routine maintenance and fault location—even to individual subassemblies. And all routine maintenance can be done without interrupting service.

Together, the 36A and 78F2 make a compact, reliable system, anywhere and everywhere.

To find out more, write GTE Lenkurt, Microwave Systems, 1105 County Road, San Carlos, CA 94070.

GTE LENKURT

Circle 42 on coupon page 81

(Continued from page 87)

analysis; **James N. Ogden**, vice president-general counsel; **Earl Oliver**, vice president-personnel; **George Pipas**, vice president-communications and computer services; **Paul H. Reistrup**, vice president-traffic; **A.L. Sams**, vice president and chief engineer; **Arthur Skrivan**, vice president-real estate; **William J. Taylor**, vice president; **B.D. Venable**, chief mechanical officer; **Otto H. Zimmerman**, executive vice president-operations.

ILLINOIS TERMINAL.—**T.S. Belew** named superintendent, Southern district, with headquarters at McKinley Yard. **C.J. Greeling** named assistant superintendent, Southern district, Federal, Ill.

JERSEY CENTRAL.—**John F. Dunseth** appointed vice president-marketing and sales, Newark, N.J. Mr. Dunseth was formerly general manager, system sales, **Milwaukee**, at Chicago, with responsibility for that road's national accounts, foreign freight and rail-highway sales.

LOUISVILLE & NASHVILLE.—**Kelly J. King** named assistant to vice president-comptroller.

W. Albert Rice, superintendent, locomotive operations, appointed general road foreman of engines-systems. **J.R. Morton** named industrial engineer-train operations.

MANUFACTURERS RAILWAY/ST. LOUIS REFRIGERATOR CAR CO.—**George K. Bennett** elected a vice president; **Roy W. Chapman**, vice president and treasurer; **Eldon D. Harris**, secretary and director of personnel, insurance and claims; **Milton W. Smith**, assistant secretary, all effective Oct. 1. **Edward R. Goedeke, Jr.**, appointed director of sales and service and **Arthur W. Hellwig**, manager of operations-transportation. **David Hamel** appointed manager, and **Walter J. Andrews, Jr.**, assistant manager, St. Louis Refrigerator Car Co.

MILWAUKEE.—**Edgar W. Chesterman**, assistant vice president-pricing, retired Aug. 31 after more than 48 years' service.

John A. Moores, personnel officer, appointed manager of salary administration.

MISSOURI PACIFIC-TEXAS & PACIFIC.—**Paul E. Resetar**, assistant district sales manager, San Francisco, named district sales manager, Pittsburgh, to succeed **Ralph M. Steiner**, who retired Aug. 31 after 44 years' service. Mr. Resetar's successor is **Joseph W. Roberts**, sales representative, Dallas. **Edward R. Hornig**, sales representative, Denver, named sales manager there. **Hugo Cervantes**, general agent, Mexico City, retired Aug. 1.

Federico C. Miranda, Jr., assistant general agent, Mexico City, Mex., promoted to general agent there.

NORFOLK & WESTERN.—**Robert S. Ingram** appointed manager of intermodal marketing and operations planning, Roanoke. Mr. Ingram was formerly manager of intermodal services, **Jersey Central.**

William D. Lovell, division engineer-maintenance, Roanoke, transferred to the Decatur Division, Decatur, Ill. **J.C. Moynihan**, office engineer, appointed division engineer-maintenance, Roanoke. **W.H. Williamson, Jr.**, manager quality production, appointed division engineer-maintenance, Shenandoah Division, Roanoke. **H.G. Angle**, chief draftsman, named design engineer, Roanoke, succeeding **W.D. Mason, Jr.**, promoted to office engineer there. **L.O. Turner**, draftsman, promoted to chief draftsman. **W.H. Yost, Jr.**, division engineer-maintenance, Bluefield, W. Va., named track engineer, Lake Region, Cleveland. **Otis L. Roberts** succeeds Mr. Yost.

SANTA FE.—**Charles E. Jeffress**, assistant manager, cost accounting, appointed manager of statistics, accounting department, Chicago, succeeding **E.M. Mills**, who retired Aug. 1.

R.L. Banion named superintendent, Los Angeles division, San Bernardino, Calif.

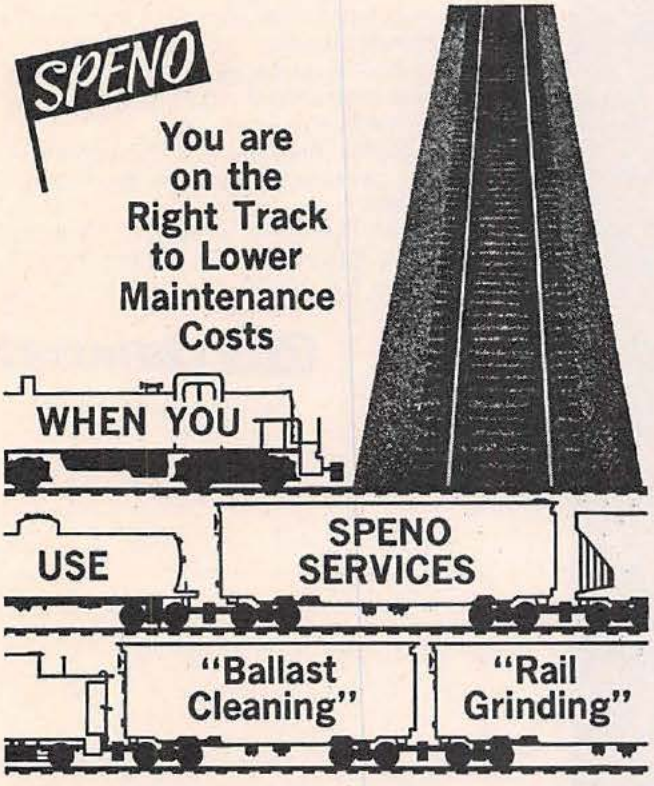
Lydia Levickas appointed assistant to manager, personnel development, Chicago.

UNION PACIFIC.—**Thomas B. Graves, Jr.** named assistant vice president-marketing, Omaha, to succeed **Dr. Reno C. Pretti**, vice president-marketing, resigned. Mr. Graves was formerly assistant vice president-automotive, **Penn Central.**

Norman D. Nelson, assistant superintendent, Utah division, Salt Lake City, named manager, safety and courtesy, Omaha, to succeed **W.B. Groome**, retired.

Donald L. Coburn, general locomotive foreman, Omaha, named superintendent of shops there.

(Continued on page 97)



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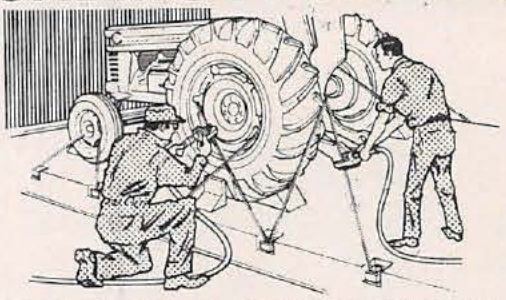
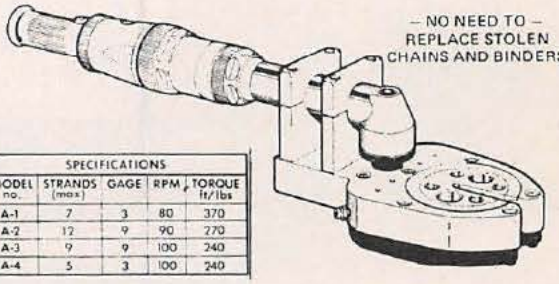
Circle 43 on coupon page 81

LOADING PROBLEMS?



DOUBLE YOUR TIE DOWN EFFICIENCY AT A LOW COST..... With a unique new wire twisting tool engineered and manufactured exclusively by the J.X. PALMS COMPANY. Currently in use on the loading docks of the MASSEY-FERGUSON and FORD MOTOR COMPANIES, our wire twister has won their highest commendations and endorsement. A compact, lightweight tool that promises to out perform any similar equipment, it is A.A.R. approved and conforms to all insurance specifications.



SPECIFICATIONS				
MODEL no.	STRANDS (max.)	GAGE	RPM	TORQUE ft/lbs
A-1	7	3	80	370
A-2	12	9	90	270
A-3	9	9	100	240
A-4	5	3	100	240

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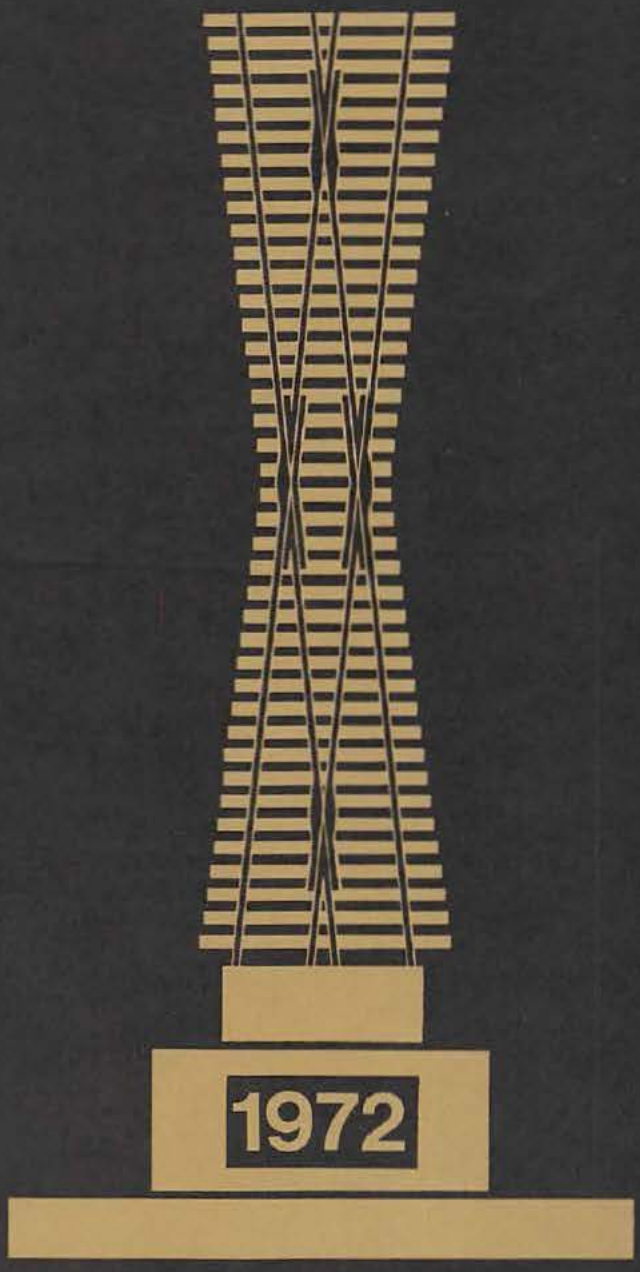
Circle 44 on coupon page 81

Circle 45 on coupon page 81 ▶

LET'S IMAGINE THERE WAS THE GOLD TRACKWORK AWARD.



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But then, we have a head start on everyone else. We've been making frogs, switches and crossings since 1879. We were the best then. We're the best now. And we'll be on top tomorrow, too.

The award would cover a lot more than just quality products. Our dependable delivery would score points. So would our ability to handle tricky trackwork situations. And the aid and counsel of our top-notch track experts.

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Whiting finds so many ways to cut your service costs

There are an encouraging number of new ways to shave time from maintenance schedules. Your Whiting engineer can show you most of them.

Our reputation for improving rolling stock service techniques has led to some interesting assignments. Like developing *complete systems* for Progressive Spot Repair, for washing out covered hopper cars, for filling locomotive sand boxes faster, for moving and spotting cars by remote control.

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ASK FOR Bulletin GT-104 describing Whiting ROBOT Remote Control Car Progression Systems for a wide range of repair and service operations.

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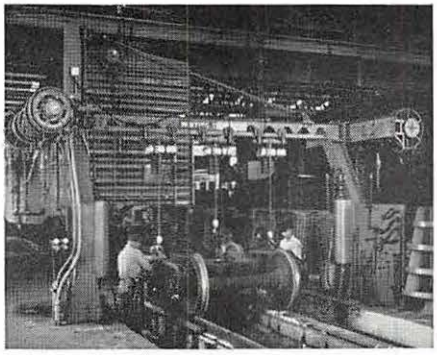
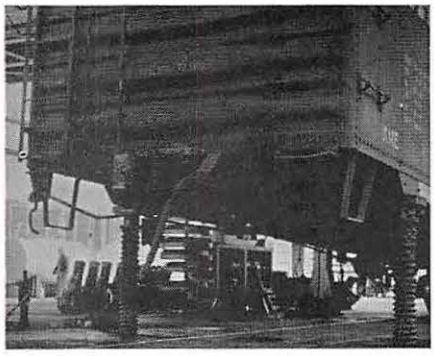
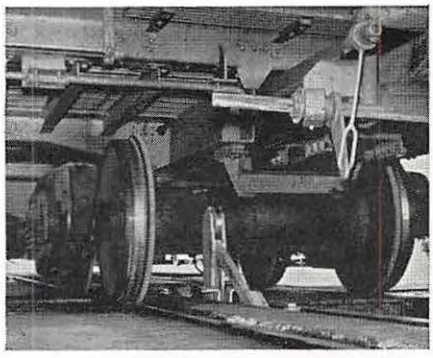


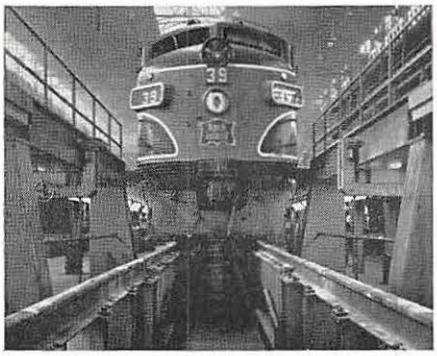
REPAIR STATION JIB CRANES



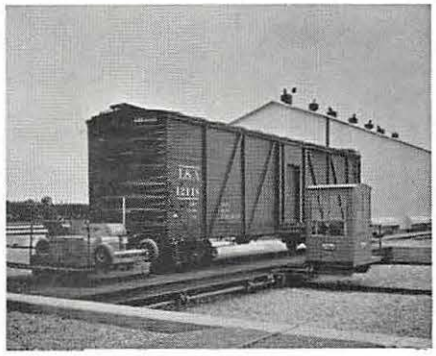
LATERALLY ADJUSTING RIPJACKS



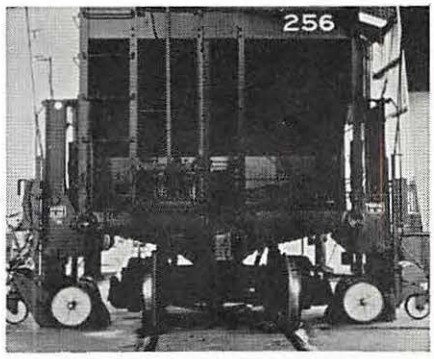
"ROBOT" REMOTE CONTROL CAR MOVERS



DROP TABLES

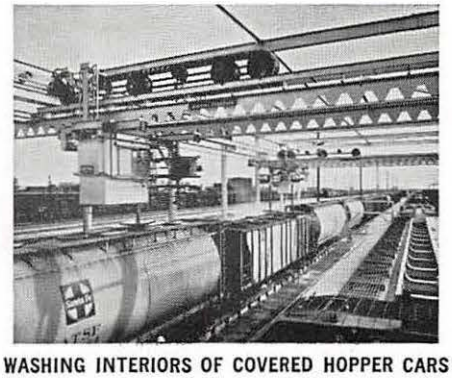


TRANSFER TABLES



PORTABLE JACKS UP TO 50-TON

TRAIN WASHING SYSTEMS



WASHING INTERIORS OF COVERED HOPPER CARS

LOCOMOTIVE SERVICE GANTRIES

Circle 46 on coupon page 81

(Continued from page 94)

WESTERN PACIFIC.—**Peter Citron,** assistant to vice president-marketing, retired July 31 after 39 years of service.

TRANSIT

Gladstone L. Chandler, City Manager of East Cleveland, Ohio, has been appointed assistant general manager for staff services, **Metropolitan Atlanta Rapid Transit Authority.**

SUPPLY TRADE

James E. Orr, Jr., vice president, **Davis Brake Beam Co.,** Johnstown, Pa., has been elected president, succeeding **James E. Orr, Sr.,** retired.

Paul Martin, product line manager, maintenance of way, **Railroad Accessories Co.** division of **Safetran Systems Corp.,** at Minneapolis, Minn., has been appointed vice president and general manager, Louisville division. **Fred D. Salmon,** manager of accounting, Railroad Accessories Division, Minneapolis, has assumed the additional responsibilities of corporate manager-warehousing.

Richard M. Mison, Wayne, N.J., will handle marketing of the ENTEL Railway Communications Systems for **Nelson Tansley Limited,** London.

Russell F. Wurst has been appointed manager-engineering and car design, **International Car Co.**

Warren A. Fox, regional manager, Northeastern Region, **Electro-Motive Division** of **General Motors,** has been promoted to assistant general sales manager in charge of domestic locomotive sales. Mr. Fox succeeds **James B. Swindell,** retired, and in turn is succeeded by **Bruce C. Burdick,** district manager, Northeastern Region.

William Van Der Sluys, general manager, transit engineering, **Pullman-Standard Division of Pullman Incorporated,** has been named director of marketing for transit sales, with headquarters in Chicago. **Thomas J. O'Neill** has been appointed acting general manager, transit engineering, to succeed Mr. Van Der Sluys.

Lyle G. Hall, Jr., has been elected president, **Stackpole Carbon Co.,** St. Marys, Pa., succeeding the late **George E. Ritter.** Mr. Hall previously was assistant secretary and treasurer.

T. Stanford Cooke, Jr., has been appointed assistant vice president, **Ortner Freight Car Co.,** Cincinnati, Ohio. Mr. Cooke has more than 25 years of experience in the railroad and railroad-allied industries, including 18 years in the Mechanical Department, Seaboard Air Line.

Maurice E. Costello has been appointed national manager of railroad sales, **C&D Batteries** division of ELTRA Corp. After an indoctrination period at company headquarters in Plymouth Meeting, Pa., Mr. Costello will work out of the branch office in Franklin Park, Ill. He was formerly vice president-sales, **McConway & Torley Corp.**

Dresser Transportation Equipment Division, Dresser Industries, Inc., has completed a licensing agreement with **Dominion Foundries & Steel Co.** (Dofasco), Hamilton, Ontario, Canada, under which Dofasco will produce, sell, and service Dresser railway specialty products in the Canadian markets.

Donald W. Paul has been promoted to Western Distric sales manager, **FreightMaster** Division of **Halliburton Co.** at Walnut Creek, Cal. He was previously sales/service engineer in that area. Prior to joining FreightMaster in 1968 he was with the **Soo Line.**

OBITUARY

L.R. Beals, retired personnel officer and assistant to general manager, **Clinchfield,** Erwin, Tenn., died June 6 in Grenoble, France.

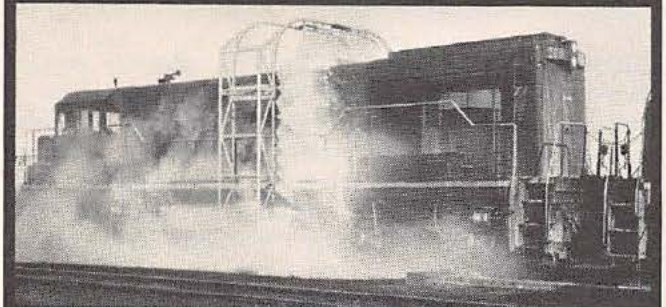
William T. Burns, retired vice president of traffic, **Union Pacific,** died Aug. 7 in Chicago.

Ernest M. Hunt, retired freight traffic agent, **Louisville & Nashville,** Mobile, Ala., died Aug. 10.

Edward F. Martin, 52, director of transportation, **Trailer Train Co.,** died July 29 in Central Du Page Hospital, Winfield, Ill.

George E. Ritter, president, **Stackpole Carbon Co.,** St. Marys, Pa., died Aug. 11 in a hospital in Boston, Mass.

DIRT & GREASE VANISH with LIX CLEANERS



Cleaning dirty locomotives and cars comes easy with Lix Cleaners. Grit, grime, dirt, even burned-on carbon simply VANISH when you use Lix Cleaners.

Everything from Automatic Wash Rack to Soak Tank; Spray and rinse and evaporative types are available from the Lix line of specialized diesel cleaners. For years, many American railroads have depended on Lix Cleaners.

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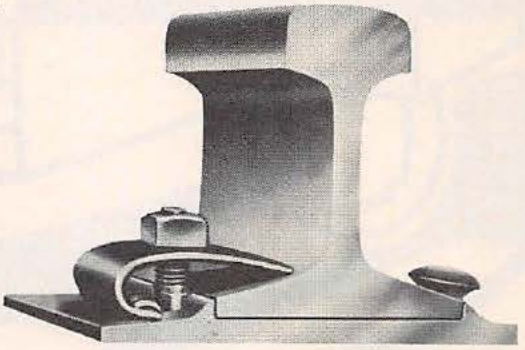

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- Costs less per mile
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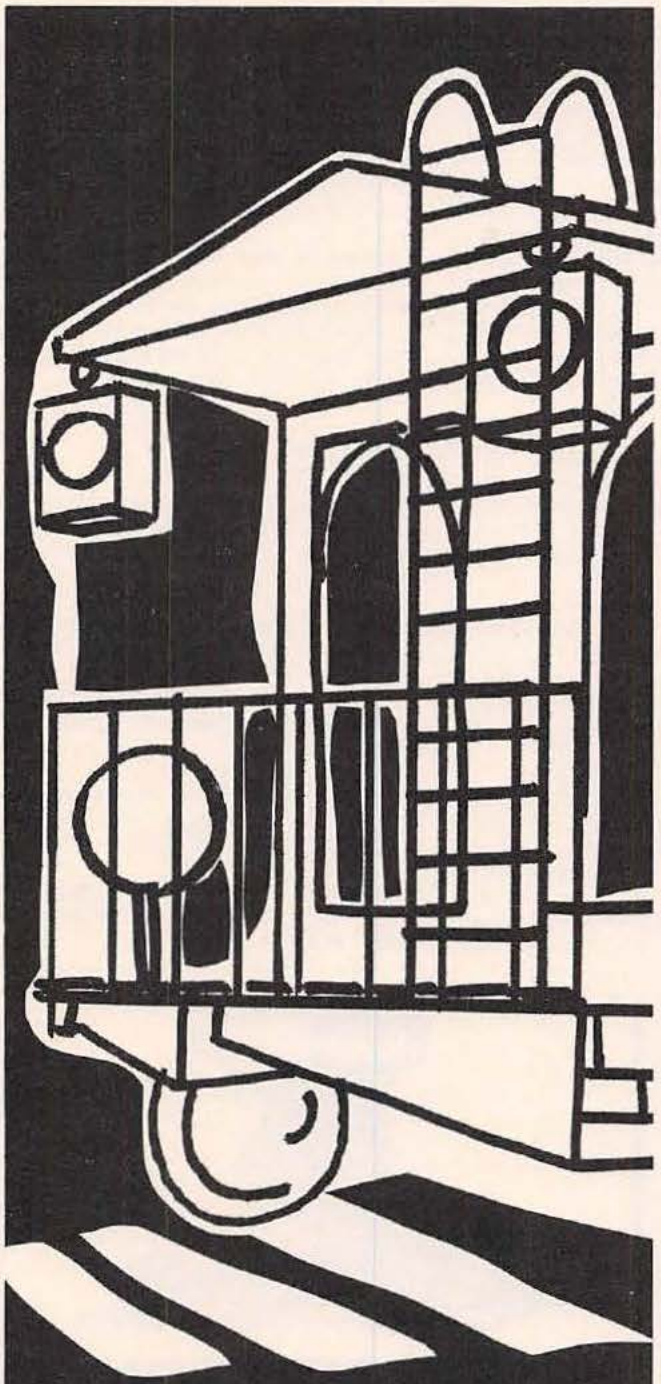

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Examine EMPRO signs up close.

See you at the RSA Exhibition.

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Circle 49 on coupon page 81

BOOKSHELF

ARCADE & ATTICA RAILROAD, by Edward A. Lewis. The 15-mile A&A is truly the archetype of an American short line railroad. General Manager Ed Lewis portrays the genesis of the little railroad and outlines its trials and triumphs through nearly a century. A&A and its predecessor companies went through periods of expansion which once extended the line to 59 miles. There were bankruptcies, a change of gauge, a takeover by a bigger railroad, along with recurring snow and flood disasters. There was an attempt to salvage passenger business with rail cars. And then, in 1941, there was dieselization. A&A went back to steam and passengers strictly on a tourist basis in 1962, and 1971 was the best passenger year in the road's history. Freight reached a peak in 1970, but dropped off when a major shipper closed his plant at Arcade late that year.

All these phases of A&A's history are covered by a great collection of photographs spanning nearly 100 years (and including three taken by the reviewer when he rode from Attica to Arcade in the mixed train in 1957). It is a good piece of Americana—a story of free enterprise at work in its purest form. *Price: $3 postpaid; 104 pages, 8 1/2 by 11 inches, softbound; The Baggage Car, Box 81, Arcade, N.Y. 14009.*

—Robert G. Lewis

PIGGYBACK TRAILER HITCHES, prepared by the Railway Educational Bureau. This 124-page pocket manual includes a Quick Identification Table, numerous illustrations of complete hitches and of details, and a text which discusses the half-dozen types in general use on piggyback cars. Operation, repair and maintenance of each type are detailed. *Prices: single copy—$5; 5 to 49 copies—$3 each; 50 to 99 copies—$2.75 each; 100 or more copies—$2.50 each; Railway Educational Bureau, 1809 Capitol Ave., Omaha, Neb. 68102.*

CUSHION UNDERFRAME DEVICES, prepared by the Railway Educational Bureau. This pocket-size manual is intended to serve as a means of familiarizing its readers with six of the end-of-car and sliding-sill type hydraulic cushioning units. For each such device there are nomenclature, functioning and maintenance recommendations. In the 160 pages are many drawings and illustrations which serve to explain the accompanying text. *Prices: singe copy—$5; 5 to 49 copies—$3 each; 50 to 99 copies—$2.75 each; 100 or more copies—$2.50 each; Railway Educational Bureau, 1809 Capitol Ave., Omaha, Neb. 68102.*

SPECIFICATIONS FOR INTERNATIONAL FREIGHT CONTAINERS, by the American National Standards Institute. Recommendations of the International Organization for Standardization (ISO) on container specifications have now been made an American National Standard. Carriers, lessors, repair facilities and others involved with international containers will find the dimensions, ratings, specifications for testing, corner fittings, marking and terminology all valuable. *Price: $6.50; American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.*

Market Outlook

CARLOADINGS

Loadings of revenue freight in the week ended Aug. 26 totaled 526,135 cars, according to the Association of American Railroads. This was an increase of 9,078 cars, or 1.8%, compared with the previous week, and an increase of 11,626 cars, or 2.3%, compared with the corresponding week last year. Ton-miles generated by carloadings in the week ended Aug. 26 are estimated at 15.7 billion, an increase of 5.8% above the corresponding week of 1971.

REVENUE FREIGHT CARLOADINGS

Commodity	Aug. 26 week	Aug. 19 week
Grain	30,375	31,015
Farm products	8,503	8,628
Metallic ores	49,233	45,576
Coal	88,089	89,857
Crushed stone, gravel & sand	31,360	31,028
Nonmetallic minerals	11,646	11,320
Grain mill products	18,776	18,503
Food and kindred products	24,301	24,008
Primary forest products	24,711	24,640
Lumber & wood products (except furniture)	17,584	17,383
Pulp, paper & allied products	23,000	23,060
Chemicals & allied products	24,806	24,287
Petroleum products	9,471	9,384
Stone, clay & glass products	21,598	21,380
Coke	7,337	6,918
Metals & products	23,323	22,284
Motor vehicles & equipment	21,019	19,371
Waste & scrap materials	14,747	14,474
Forwarder & shipper assn. traffic	6,647	6,525
All other carloads	69,039	67,376
LCL traffic	570	505
Total cars loaded	**526,135**	**517,522**
Cumulative total, 34 weeks	1972	1971
	16,715,608	16,964,107
Estimated revenue ton-miles (billions) 34 weeks	502.7	489.3

PIGGYBACK LOADINGS

U.S. piggyback loadings for the week ended Aug. 19 totaled 26,269 cars (8.3% above the corresponding week last year) and 44,506 trailers or containers (up 10.8% from 1971). Cumulative volume for the first 33 weeks of 1972 is 812,298 cars (up 8.9% from last year) and 1,362,316 trailers or containers (up 12.2% from 1971). In addition to freight, 2,009 cars carrying 3,510 trailers or containers of mail and express traffic were handled piggyback. Cumulative figures for the first 33 weeks of 1972 are 75,676 cars (down 25.0% from the 1971 total), and 122,024 trailers or containers (down 19.6% from 1971).

IN CANADA

7 days ending	Tons of Revenue Freight	Cumulative Totals
Aug. 14, 1972	3,381,693	124,969,422
Aug. 14, 1971	4,482,661	126,569,759

● *Penn Central.*—Plans acquisition by lease of 500 50-ft, 70-ton general-purpose box cars to be built by Pullman-Standard for delivery beginning in September.

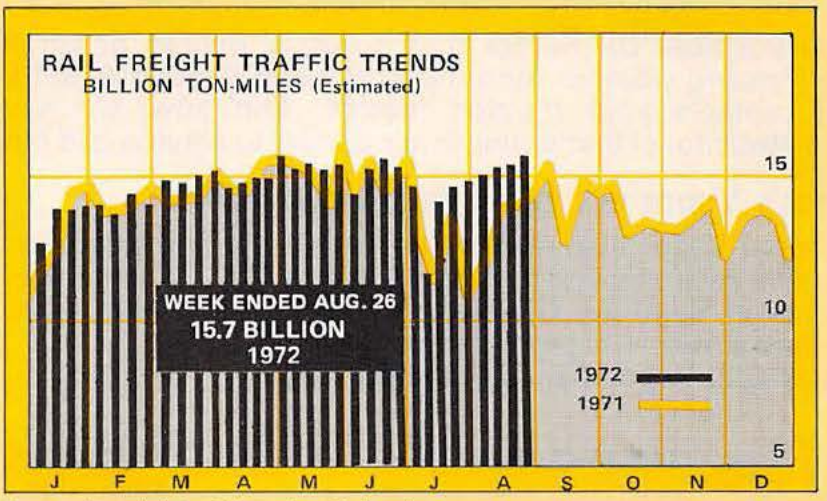
● *Santa Fe.*—Ordered 1,000 100-ton covered hopper cars from Pullman-Standard and 100 open-top cross hopper cars from Greenville Steel Car at a cost of about $19 million. Delivery is expected in November.

● *Trailer Train.*—Ordered 11 Vert-A-Pac cars from Pullman-Standard. This brings TTX purchases of new cars since Jan. 1 to 1,018. TTX now has 60,418 cars in service or in order.

● *Freight-car orders and deliveries.*—The following report has been received from the AAR and the ARCI:

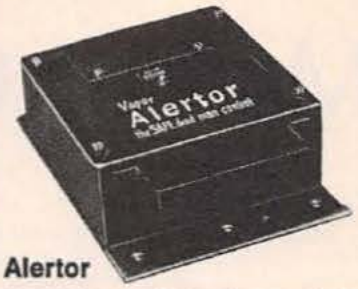
	July 1972	June 1972	July 1971
DELIVERED			
Built new by carbuilders	2,297	3,705	2,719
Built new in R.R. shops	549	646	609
Built new—total	2,846	4,351	3,328
Rebuilt	125	119	988
TOTAL DELIVERED	**2,971**	**4,470**	**4,316**
ORDERED			
To be built new by carbuilders	2,711	4,543	3,649
To be built new in R.R. shops	211	1,380	155
To be built new—total	2,932	5,923	3,804
To be rebuilt	−68	506	100
TOTAL ORDERED	**2,864**	**6,429**	**3,904**

ON ORDER AND UNDELIVERED	Aug. 1, '72	July 1, '72	Aug. 1, '71
To be built new by carbuilders	12,340	11,921	24,280
To be built new in R.R. shops	4,687	5,015	4,267
To be built new—total	17,027	16,936	28,547
To be rebuilt	1,906	2,099	2,343
TOTAL ON ORDER	**18,933**	**19,035**	**30,890**



Source: Association of American Railroads

What's Vapor doing for your locomotives?



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Speed-Log

Pace Setter

Fuel Oil Heater

Automatic Ground Reset Limiter

New-Matic Toilet

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CALENDAR

The 91st annual meeting of the **American Transit Association** will be held in the Olympic Hotel, Seattle, Wash., Sept. 24-28. The ATA is arranging three post-meeting trips—with tours departing from Seattle on Sept. 28 to Hawaii, the Orient or to San Francisco.

Defense transportation needs in relation to the national transportation policy will be evaluated at the 27th annual **Transportation and Logistics Forum and Exposition** in San Antonio, Texas, Sept. 26. The forum, sponsored by the National Defense Transportation Association, will feature three panel discussions. One panel—to be moderated by Vincent F. Caputo, Director of Transportation and Warehousing Policy, Office, Assistant Secretary of Defense (I&L), Dept. of Defense—will discuss "Defense Posture/Requirements."

Carnegie-Mellon University's Transportation Research Institute has scheduled the fourth **Professional Program in Urban Transportation** for the fall of 1972. The program, initiated in 1970, will be offered Oct. 1 through Nov. 12. It is directed toward professionals in transportation and related fields seeking a background in fundamentals and a comprehensive knowledge of modern concepts and techniques in urban transportation. The program consists of a four-week course utilizing special professional educational facilities at the university and a two-week lecture-study tour of transportation systems in North American and European cities.

The 65th annual meeting of the **National Industrial Traffic League** will be held in the Americana Hotel, New York City, Nov. 15-17. The executive committee will meet Nov. 14 and will finish its work by noon on Nov. 15. The general membership meeting will begin at 2 p.m., Nov. 15. The League's annual luncheon will be held on Nov. 16.

The date of the Transportation Data Coordinating Committee's 1972 **Transportation Data Systems Forum** has been changed to Dec. 5-6. It will be held in the Presidential Ballroom of the Statler Hilton Hotel, Washington, D.C. The change was made to avoid conflict with other major transportation meetings and to permit expansion of the forum's scope.

The **Commerce and Industry Association of New York** has announced its fall 1972 schedule of industrial transportation workshops, a portion of which follows: "Negotiating for and managing leased commercial vehicles," Sept. 21; "How to improve industrial representation before the ICC and rate bureaus—for practitioners and others," Oct. 25; "Dangerous articles and hazardous material, protecting corporate liability," Nov. 9. All workshops will be held at the Traffic Club of New York.

The 25th annual **International Conference on Handling Perishable Agricultural Commodities** will be held at Purdue University Mar. 12-14, 1973. The emphasis will be on the handling of potatoes and fresh meat, and refrigeration as it relates to each item.

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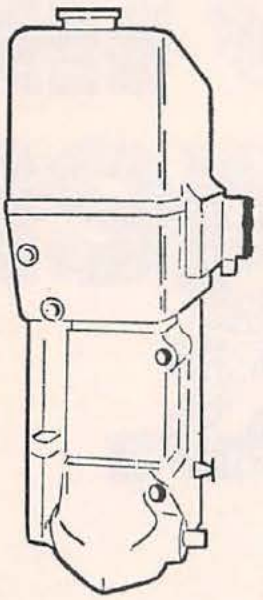

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Viewpoint

At last: A railroad study worth studying

Studies of "the railroad problem" are nothing new. The shelves of official Washington groan under their weight. Now there is another one. It's short (100 pages). And it grinds no axe except that of sound transportation. It should be required reading for all serious students of the art and craft of moving freight.

Reference is made elsewhere in this issue (pp. 5 and 45) to this study. Entitled "The American Railroads: Posture, Problems and Prospects," it was written by Consultant Richard J. Barber (who was assistant secretary of transportation, policy, from 1967 to 1970) for the Senate Commerce Committee. In our opinion, it is worth all of the other studies of "the problem" combined.

If any single paragraph in this report could be selected as representing its conclusions, it would be the following:

"Many of the problems of the railroads reflect the lack of a coherent, integrated transportation policy in the United States. Government transportation programs—in regulation, financial aid, infra-structure support, and other areas—have grown up piecemeal over the years. That they are often uneven and sometimes inconsistent is less a surprise than a confirmation of their patchquilt character. Because government railroad policy has grown over a century, rail transportation tends to be most heavily burdened and least favored by existing public policies. Policy changes are needed in such areas as rate regulation (particularly at the Federal but also at the state level) and financial aid that would increase intramodal and intermodal competition and achieve greater uniformity between the modes."

Mr. Barber is pessimistic as to the early chances of winning these policy changes and financial aid. Actually, it seems to us that his own study, if Congress gives it the attention it deserves, could do much to hasten the passage of corrective legislation—specifically, the Surface Transportation Act of 1972.

Fortune smiles on a merger that worked

Probably because its field is the whole world of business and industry, Fortune doesn't often get around to deep coverage of the railroad industry. But in its August issue, Fortune did—with a comprehensive look at Burlington Northern, 29 months after merger (the same length of time after merger, writer Rush Loving, Jr., points out, that Penn Central went bankrupt).

And the conclusions reached by Fortune? Generally, they're the same ones Railway Age has reached, in our continuing coverage of BN from M-Day on. Fortune's headline: "A Railroad Merger That Worked: By successfully putting together a rail system even larger than Penn Central, Burlington Northern proves that mergers can indeed serve the public interest."

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